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AT&T widens virtual data service reach

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T plans in July to extend the reach of its Software-Defined Data Network (SDDN) service to off-net sites and give customers better SDDN management tools.

AT&T wants SDDN to do for data what SDN did for voice, said Glenn Starr, division product manager for Software-Defined Networks at AT&T. "We think these enhancements will get users to combine voice and data traffic under the SDN umbrella," Starr said.

SDDN was announced three years ago this month as a data option for SDN users. Like SDN, SDDN is a virtual network service under which network paths are defined in AT&T switch software and links are established on an as-needed basis.

The service is accessed using an Integrated Services Digital Network Primary Rate Interface (PRI) and is currently available at 56K, 64K, 384K and 1.544M bit/sec.

Although it can support band-

(continued on page 56)

PHOTO ©1993 JOHN THOMPSON

CrossComm VP Larry Samberg with President and CEO Tad Witkowitz.

Database API groups draw cheers and jeers at show

By Wayne Eckerson
Senior Editor

SAN FRANCISCO — The rift between rival database APIs widened at DB/EXPO '93 here last week when Microsoft Corp. and others began to publicly criticize the Integrated Database Application Program Interface on technical grounds.

Critics of IDAPI, an API for accessing SQL and non-SQL databases from different platforms, said the specification is woefully incomplete, lacks important functionality and imposes significant performance overhead. Others criticized IDAPI for not specifying exactly what is required for vendors to comply with the specification.

"The IDAPI team has a gigantic hole in its effort because it has no plans at all to specify what it means to be compliant with IDAPI," said John Rymer, vice president at the Patricia Seybold Group, Inc. in Boston. "This leaves the

(continued on page 54)

CrossComm sets its router sights on SNA

ILAN XL 80 will have horsepower and reliability required to woo SNA users to LAN internets.

By Maureen Molloy
Senior Editor

MARLBOROUGH, Mass. — CrossComm Corp. next week will announce a high-end multiprotocol router intended to provide the performance and reliability needed to persuade SNA users to make the jump to router-based backbones.

CrossComm's ILAN XL 80 will join a growing list of high-end routers that support impressive throughput rates and are highly redundant. But CrossComm claims its entry is unlike the others because it is architected to support the low latency and reliability that Systems Network Architecture users need today and the peer-to-peer nets they will need tomorrow.

The ILAN XL 80 will also be the first router outfitted with a 3.2G bit/sec switching matrix capable of switching both variable-length local-area network packets and 53-byte Asynchronous Transfer Mode (ATM) cells.

"The new router essentially guarantees continuous availability [for IBM data] and the ability to support users' ATM needs down the road," said Larry Samberg, CrossComm's vice presi-

(continued on page 54)

INSIDE

LAN users resort to the glasshouse approach to coordinate centralized backup of enterprise data. Page 38.

Throughput trial puts high-speed modems to the test. Page 40.

DEC to forge All-In-1 ties to TeamLinks

By Jim Duffy
Senior Editor

MAYNARD, Mass. — Digital Equipment Corp. last week outlined efforts to turn its All-In-1 office suite into a client/server package that can take advantage of E-mail, file handling, conferencing and other services provided by DEC's TeamLinks groupware.

At the same time, DEC unveiled new All-In-1 software that makes the office automation package easier to install and use.

TeamLinks, which started shipping last September after a six-month delay, is a set of software packages designed to hook Windows-based Pathworks local-area network clients into DEC electronic mail backbones.

The package also provides file and document handling services. electronic conferencing and data

(continued on page 55)

European standards plan raises hackles at U.S. firms

By Ellen Messmer
Senior Correspondent

SOPIA ANTIPOLIS, France — Under a new legal policy set by the European standards-making body here, companies hoping to see their patented technology incorporated into standards will have to sign away fundamental legal rights to their intellectual property.

The new "Intellectual Property Rights (IPR) Policy and Undertaking" guidelines from the European Telecommunications Standards Institute (ETSI) require companies to notify ETSI within 180 days if they do not want their technology to be used in European standards.

If companies that sign the IPR agreement miss the notification deadline, ETSI automatically gets the right to incorporate the technology in standards and dictate how it will be licensed to other firms.

ETSI is demanding that all members — including U.S. companies such as AT&T, IBM and Motorola, Inc. — interested in playing a role in European standards development sign the policy agreement within six months or face being kicked out of the organization.

ETSI is a private organization of dues-paying members but is funded by the European parliament, which established it as the technical standards-setting body

(continued on page 54)

NETLINE

NOVELL TO HAND OFF 3270 emulation business. Page 6.

LEGENT PREPS host-based software distribution tool for multivendor nets. Page 6.

SUN SHINES with SPARC server, Banyan VINES deal. Page 6.

BUILDING ON FOUNDATION, Andersen Consulting improves client/server development system. Page 6.

HP, COMPAQ AND DELL plan Pentium-based LAN servers. Page 6.

DB/EXPO HOSTS slew of connectivity announcements. Page 53.

HP ROLLS OUT systems management tools for OpenView. Page 53.

NEWSPAPER

100

It's a jungle out there. And your people are demanding bigger, faster and more diverse services. Like E-mail, video conferencing. LAN interconnection and high-speed data transmission. This means your network is growing in size and complexity. That's why you should call on your local phone company. Your phone company is backed by the products and services of AT&T and AT&T Bell Laboratories. That makes it easier for them to give you the quality and reliability you need. So it'll be easier for you to get your service up. To get all your people hooked up. And to keep your network up. Plus, your phone company can provide all the bandwidth you demand, on demand. So call your local phone company. Because it could mean the difference between data networking and data not working.

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Network Systems

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Recent events suggest the administrative burdens of your network could grow substantially.

Apple fleshes out Mac's role in enterprise systems

Offers interface to link DAL with ODBC, publishes VITAL model for coordinating enterprise elements.

By Fredric Paul
Senior Editor

SAN FRANCISCO — Apple Computer, Inc. last week made a pair of announcements designed to shore up the role of the Macintosh in multivendor enterprisewide systems.

First, the company introduced extensions to its Data Access Language (DAL) that will let it work with Microsoft Corp.'s Open Database Connectivity (ODBC) interface and support Transmission Control Protocol/Internet Protocol connectivity to additional host platforms.

Second, Apple published the VITAL Technical Architecture Guide. VITAL, or Virtually Integrated Technical Architecture Lifecycle, is Apple's model for pulling together the various elements of an enterprisewide information system (IS) so they all work together efficiently.

DAL is client/server middleware that gives Windows and Macintosh applications point-and-click access to data stored on different types of servers, said John Nauman, senior director of integration technologies for Apple's Enterprise Systems Division (ESD).

(continued on page 56)

Lotus seeks new partners for Notes work flow wares

Company also to deliver work group-based 1-2-3.

By Wayne Eckerson
Senior Editor

BOSTON — Lotus Development Corp. last week put some distance between itself and work flow partner Action Technologies, Inc. when it announced a new strategy to seek partnerships with any vendor seeking to integrate work flow software with Lotus Notes.

"We realized work flow computing is such a broad area that no one vendor can possibly provide all the technology needed to satisfy all user requirements," said Mike Mitsock, marketing manager of Lotus Companion Products, during a press briefing at LotusWorld Conference and Exposition here.

Lotus also announced at the show a new work group version of its 1-2-3 spreadsheet and a strategic alliance with SkyTel Corp. to integrate one-way wireless messaging with Notes.

In addition, Jim Manzi, Lotus chief executive officer, used his keynote address to underscore a recent concession from archrival Microsoft Corp., which said it will modify its Windows-based applications to work better with Notes. Manzi said Microsoft's pro-

(continued on page 10)

AT&T plan offers savings on dedicated local access

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — Following MCI Communications Corp.'s lead, AT&T last week offered customers big discounts on local access in exchange for long-term contracts, a move that will result in substantial savings for users.

Under AT&T's Access Value Plan (AVP), users that sign one- to five-year contracts can save up to 24% on dedicated access, which can account for as much as half the price of an end-to-end private line.

"Users told us that their preferred mode of operation would be to deal with us exclusively for handling [access] ordering, turning on, trouble resolution and billing," said Hemant Vaidya, division manager for Accunet dedicated services with AT&T. "National companies said they were tired of dealing with many local carriers for dedicated access."

The new AT&T plan is more ambitious than the carrier's Access Multi-Service Volume Pricing Plan which was introduced last August (*NW*, Aug. 10, 1992, page 1). That plan offers discounts of as much as 10%.

(continued on page 9)

Briefs

Oracle preps Version 7.1. Larry Ellison, chairman of Oracle Corp., last week described an impending upgrade to the Oracle 7 database management system that will support a range of high-volume commercial applications, such as personalized newspapers and video-on-demand telecommunications services. Version 7.1 will add a feature called a Parallel Data Query, which allows a single SQL statement or request to be processed by multiple processors in parallel. When run on large parallel processor computers, Oracle 7.1 will enable thousands of users to access stored data or video concurrently without sacrificing performance or data integrity.

DEC to deliver on DCE. Digital Equipment Corp. this week will unveil Open Software Foundation, Inc. (OSF) Distributed Computing Environment (DCE) software for its DEC OSF/1 operating system. The product will let programmers create applications that operate across multivendor platforms distributed throughout an enterprise network. DCE for DEC OSF/1 will be available in July and is priced from $235 to $2,360.

Two heavyweights join forces. IBM and Oracle Corp. last week announced they will jointly market Oracle's full range of software products for IBM's RISC System/6000 Unix processor. The two companies will cross-train sales teams, cosponsor customer seminars, demonstrate one another's products and jointly participate in trade show exhibits. The agreement builds on a prior relationship in which the two companies shared technical resources to integrate Oracle's symmetric multiprocessing and parallel processing database technologies with IBM RS/6000 processors.

Novell forges IBM management ties. Novell, Inc. last week brought out NetWare Services Manager (NSM) (for LAN NetView) 1.5, a new version of its OS/2-based NetWare management tool. Unlike the existing versions for Windows and OS/2, the new version works unmodified with IBM's LAN NetView management product, letting administrators manage NetWare 3.X and 4.X as well as IBM LAN Server nets from a single management console. NSM 1.5 is available now for $2,495.

Stop & Shop buys Banyan LANs. Banyan Systems, Inc. and its reseller partner Wang Laboratories, Inc. last week announced a five-year contract to supply The Stop & Shop Supermarket Co. with VINES networking software for its corporate offices, distribution centers and retail locations. The software will be used to support applications such as point-of-sale, customer information and management reporting systems. Terms of the contract were not released.

AT&T takes MCI-Stentor lawsuit to Canada. AT&T last week filed a patent infringement suit in the Federal Court of Canada against the Canadian telephone partnership of Stentor and MCI Communications Corp. AT&T accused MCI-Stentor of violating four AT&T patents covering virtual private network capabilities, 800-service enhancement and advanced features, automated calling card services and techniques for blocking certain types of calls. The lawsuit includes many elements cited in an earlier patent infringement suit AT&T filed against MCI in Washington, D.C. last January, AT&T said. Although it has not yet seen the lawsuit, MCI said that if it reflects AT&T's earlier suit, MCI views the AT&T patents as unenforceable.

CONTACTS

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CONTENTS

Data Net Architectures 13
Unisys' DCP FEPs boast fault tolerance.
New high-speed pipe keeps university traffic moving.

Local Networking 15
NPI, SynOptics lead ANSI draft rollouts.
Micropolis release to up on-line storage to 93G.

Internetworks 17
Sync pack shores up IBM mgmt. functions.
Security panacea may be key to restful slumber.

Global Services 23
Rates may deter use of 800 portability.
PacBell launches a new 800 marketing offensive.

Enterprise Applications 27
Group helps users see forest through trees.
IBI, KnowledgeWare join forces in client/server mart.

Industry Update 29
Clipper Chip sets off storm of debate.
NSA critiques PEM Internet encryption application.

Management Strategies 33
Actions speak louder than 'open-door' policies.
Project aims to help users solve security problems.

Opinions 36

Features 38

Action Center 44

Networking Marketplace 52

Networking Careers 52

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Back issues ($5 per issue) can be ordered from Bobbie Cruise by calling (800) 622-1108.

Legent preps new software distributor

By Michael Cooney
Senior Editor

VIENNA, Va. — By the end of the month, Legent Corp. will roll out a mainframe-based software distribution product that will let SNA users electronically deliver software updates to multivendor equipment in their enterprise networks.

Legent's DistribuLink software promises to save users time and money while giving them a powerful tool to track software versions across their organization. It also eliminates inefficient manual "sneakernet" software distribution routines.

"Users can update remote user files or make sure everyone in the network is using the same version of an Excel spreadsheet," said Scott Cary, senior product manager for Legent. "With DistribuLink, users can centrally configure what they want their remote systems to look like."

DistribuLink is software that resides on an IBM MVS mainframe as a VTAM application. VTAM controls the communications flow in a Systems Network Architecture environment.

The software is built on top of Legent's existing XCOM LU 6.2 file-transfer software. The XCOM software provides DistribuLink with LU 6.2 connections to more than 20 vendors' equipment.

A piece of the DistribuLink and XCOM software must reside on each machine that receives software updates.

Support will be added to ensure transfers to IBM's Application System/400, Stratus Computer, Inc. or Tandem Computers, Inc. boxes.

DistribuLink is made up of a central database repository, known as a warehouse, and a variety of other customizable features that let users control when and where software upgrades will be sent. The warehouse is an SQL-based database that stores infor-

(continued on page 54)

Andersen extends reach of CASE tool to Unix systems

By Fredric Paul
Senior Editor

SAN FRANCISCO — Andersen Consulting last week announced a new version of its OS/2-based Foundation for Cooperative Processing (FCP) CASE tool that is easier to work with and can be used to develop client/server applications that employ Unix systems.

FCP is a computer-aided software engineering environment used to develop "true client/server systems," said Don Dall, managing director of Andersen's Foundation software organization, based in Chicago.

At the DB/EXPO '93 announcement here, Dall defined true client/server as the "capability to put programs — application logic and data — where you want and when you want it and then be able to change that decision later."

While the new version of FCP still works under OS/2, it can be used to build client/server applications where the server portion runs on Hewlett-Packard Co.'s HP/UX and Digital Equipment Corp.'s Ultrix machines. The client component can run under OS/2 or Windows, like the previous version.

PHOTO ©1993 DAVID WEINTRAUB

Dall

To support the move to HP/UX, Andersen announced a strategic development agreement with HP.

Andersen also plans to aggressively move FCP to Microsoft Corp.'s soon-to-be-released Windows NT operating system, initially as another server platform but as a development environment for the client, as well. No release dates have been set for the NT versions, Dall said, and they will augment, not replace, the OS/2 version. Other platforms under development include versions of Unix from the Open Software Foundation, Inc. and IBM.

In addition to Unix connectivity, the new generation of FCP includes a graphical Rapid Application Builder and object-oriented enhancements to the original local-area network-based data repository system.

The new version of FCP is available now as a free upgrade to existing users, with a small charge to expand the system onto new servers. For new users, a basic FCP setup costs about $8,000 a copy with a typical enterprise-level development project requiring about 10 copies.

Introduced in 1991 and targeted to high-end departmental users on up, current implementations of FCP are used by more than 2,800 developers in more than 70 companies.

Andersen: (312) 580-0069.

Sun preps VINES, server offerings

By Fredric Paul
Senior Editor

SAN FRANCISCO — Sun Microsystems, Inc. this week will kick off the SunWorld conference with an announcement of a multiprocessor departmental server and plans to work with Banyan Systems, Inc. to develop a version of VINES to run on Sun SPARC systems.

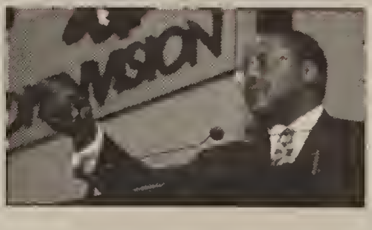
But Sun was not sitting on its hands waiting for SunWorld last week, as the Mountain View, Calif.-based company launched Interactive Unix System 4.0 at the Unix Resellers Show in Dallas and used a local amphitheater to announce technology designed to let Windows applications run under Sun's Solaris 2.0 operating system.

Filling the holes

The new SPARC server from Sun Microsystem Computer Corp. will fill a gap between the single-processor SPARCSserver 10 and the high-end SPARCcenter 2000. The new server will offer eight-way processing, while the SPARCcenter 2000 can handle 20-way processing.

"I wouldn't say there's a big gap in their product line," said David Smith, director of Unix systems and software at International Data Corp. in Framingham, Mass., but the new server is "certainly welcome. Sun is always pushing the limit on price/per-

(continued on page 55)



Correction: Due to a printer error last week, the wrong photo ran with a caption that identified Michael Fields, founder, chairman and chief executive officer of OpenVision. Fields is pictured above.

Attachmate acquires Novell 3270 emulation business

By Caryn Gillooly
Senior Editor

SUNNYVALE, Calif. — Novell, Inc. last week announced that it is selling off its 3270 terminal-emulation business to Attachmate Corp. in order to focus on its server-based SNA software.

Attachmate will assume all development, marketing, sales and support of Novell's NetWare 3270 LAN Workstation products, as well as the vendor's terminal-emulation client software for DOS, Windows, Macintosh and vector graphics workstations on NetWare local-area networks.

Attachmate will also join Novell's Technical Support Alliance to avoid finger-pointing problems regarding product support.

Novell's reason behind the move is to free up internal resources to concentrate on adding more advanced capabilities to its server-based host connectivity product, NetWare for SAA, according to Bernard Harguindeguy, marketing manager at Novell, based here.

"We're freeing ourselves completely from the [terminal-to-host] workstation environment and focusing on networking aspects," Harguindeguy said.

For example, Novell plans to give NetWare for SAA additional fault-tolerant capabilities similar to those added to the NetWare 3270 LAN Workstation for Windows version announced late last month (*NW*, May 3, page 13).

In addition, Novell will offer "a set of [application program interfaces] that can integrate [applications] with our directory services to find out where resources are, to give users better security and to tie workstation management into enterprise and server management," Harguindeguy said.

Once the agreement is finalized, Attachmate will begin developing NetWare Loadable Modules and API interfaces that integrate its own workstation products with other Novell services, such as its NetWare Global Message Handling Service (MHS).

Novell's Gerry Machi, Attachmate's Wayne Smith, Novell's Bernard Harguindeguy and Attachmate's Matt Highsmith.

A mixed bag

Some users seemed unphased by the announcement, citing this kind of move as "business as usual" for Novell since it is not uncommon for the company to sell off periphery parts of its business. Others, however, were troubled by the move.

"This is a major concern to us," said Bill Hiller, vice president at Capella Systems, Inc. in

(continued on page 10)

Server vendors ready full range of product releases

By Caryn Gillooly
Senior Editor

MAYNARD, Mass. — Digital Equipment Corp. last week introduced a server targeted at low-end customers, while Hewlett-Packard Co., Compaq Computer Corp. and Dell Computer Corp. are gearing up to announce in the next few weeks high-end servers based on Intel Corp.'s Pentium chip.

The DEC product is a scaled down version of the company's existing InfoServer, a family of network storage servers that let different types of users share multiple storage devices across an Ethernet local-area network.

For example, the InfoServer could act as a CDROM database server, providing net users with access to libraries of information from a central location. Or it could act as a tape backup or an X Window System terminal server.

The current InfoServer 150 is a high-end, $7,700 offering that provides up to 100 clients with access to as many as 14 devices through two Small Computer System Interface (SCSI) ports. Dale Rensing, marketing manager for InfoServer at DEC, based here, said not all customers need that level of connectivity.

In response, the new InfoServer 1000 supports a maximum of 50 simultaneous connections to as many as seven media devices through a single SCSI port. It costs $2,500.

Although InfoServer is a DEC product, it supports DOS and Apple Computer, Inc. Macintosh cli-

(continued on page 53)

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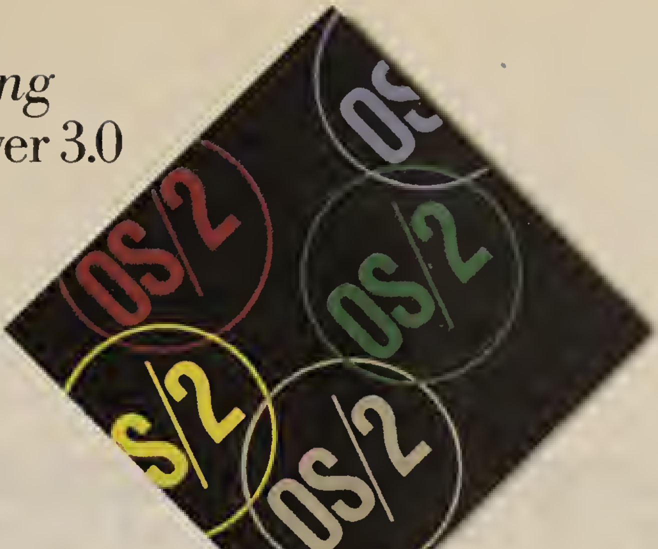

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AT&T plan offers savings on access

continued from page 5

AT&T attributes the ability to discount access provided by local carriers — the cost of which is typically passed onto the customer — to advances in the way it manages its access infrastructure. The pricing plan will take effect next week, pending Federal Communications Commission approval.

Under AVP, AT&T will offer discounts of 5%, 10%, 20%, 22% and 24% on T-1 facilities used to access a range of AT&T services in exchange for customers' commitment to keep the access links in place for a period of one, two, three, four or five years, respectively.

Other carriers' offerings

By comparison, MCI's Access Pricing Plan (APP), which was announced in January, offers smaller discounts and shorter contracts. Users can sign one- to three-year contracts and save as much as 20%.

> "Users could realize pretty good savings for the next few years, but, even with a crystal ball, it's hard to see where things are headed several years down the road."

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David Goodtree, senior manager of national accounts access marketing for MCI, last week said the carrier has asked the FCC for permission to add a four-year option with a 22% discount and a five-year option with a 24% discount.

Sprint Corp. is still evaluating access discount plans. "We're looking at an access plan, but we won't be doing anything by year end," said Glenn Hall, director of access services for Sprint. "If we did put a plan together, we'd probably offer discounts for one- to three-year contracts."

AT&T's AVP applies to all Accunet T1.5 local access channels, including those used to connect to AT&T's Accunet Switched Digital Services, Dataphone Digital Service, InterSpan Services, Megacom, Megacom 800 and Software-Defined Network offerings.

While welcoming discounts, users expressed concern about the long-term commitment required. "Dedicated access prices are falling fast," said Don Rees, a network manager with First National Bank of Maryland in Baltimore. "Users could realize pretty good savings for the next few years, but, even with a crystal ball, it's hard to see where things are headed several years down the road."

Short-term savings, however, can be substantial. For example, a 1-mile New York Telephone Co. T-1 access link in New York costs $492 a month. Under AVP, that same circuit would cost $426.55, $404.10, $359.20, $350.22 or $341.24 for a one-, two-, three-, four- or five-year agreement, respectively.

A 5-mile dedicated access link from Ameritech in Chicago would cost $506.80 a month. Under AVP, it would costs $492.86, $466.92, $415.04, $404.66 and $394.29, depending on the length of the contract.

AT&T charges users a $75 access coordination fee under AVP, a sum that firms would not pay if they bought dedicated access directly from a local exchange carrier. In addition, users would pay a $210 access connection charge to AT&T, regardless of whether they bought the access from a local carrier or AT&T.

MCI's plan offers features that AT&T's does not, including a so-called coterminous option. This gives users midway through a three-year 800, Data, Virtual Network or Vision contract to order more T-1s for the remainder of the term and still receive the maximum discount, Goodtree said.

MCI also offers a more flexible termination liability than AT&T. MCI charges users 50% of the nondiscounted monthly rate for access multiplied by the number of months remaining — but not to exceed — one month for a one-year APP, two months for a two-year plan, six months for a three-year plan, eight months for a four-year plan and 10 months for a five-year plan.

By comparison, AT&T charges 50% of the nondiscounted monthly rate multiplied by the number of months remaining on the user's AVP.

MCI also offers a move policy, which enables users that relocate within a local access and transport area to move their T-1 access link without penalty.

The changes to MCI's APP are scheduled to go into effect on June 1, Goodtree said. ◘

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The ENNE finalists will be announced in mid-September, and the winners will be announced at a reception on October 4 at NetWorld Dallas '93. Entry deadline is Friday, June 25, 1993. Be there. And toast the net results of superior work.

ENNE AWARDS

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Lotus seeks new partners for Notes

continued from page 5

nouncements testify to the growing acceptance of Notes as the premier platform for work group computing.

Seeking to keep pace with the expanding work flow market, Lotus announced joint development and marketing agreements with seven vendors of work flow technology: Delrina Technology, Inc., ELF Technologies, Inc., FileNet Corp., IET Intelligent Electronics, Ltd., Quality Decision Management, Inc., Reach Software Corp. and ViewStar Corp.

Mitsock said Lotus' customers and Business Partners, particularly value-added resellers and systems integrators, were pushing Lotus to integrate Notes with a variety of work flow products other than Action's work flow technology.

Lotus and Action have spent the past two years developing a work flow engine for Notes and piloting the technology in six beta sites. Industry observers had speculated that Action's work flow products would be marketed by Lotus as an add-on product. However, Action President Tom White said his firm will now sell its Notes-enabled work flow products directly to Notes Business Partners.

"Neither Lotus nor we were sure how we were going to distribute the work flow tools. This should clear up any confusion," said White, who admitted that there were numerous delays in hammering out an agreement acceptable to both companies.

Other products

Besides the new work flow strategy, Lotus announced a new version of its 1-2-3 spreadsheet that supports version control, tight integration with other Lotus Windows applications and a new data querying capability, among other enhancements.

The firm's 1-2-3 Release 4 for Windows incorporates Version Manager, which is based on Lotus' Chronicle technology for group-enabling Lotus applications. Version Manager allows users to create, track and manage multiple versions of the same spreadsheet. When used in conjunction with Notes, the new version of 1-2-3 enables users to concurrently add, modify and delete the same fields within a spreadsheet and keep track of ensuing versions.

The new spreadsheet version incorporates Lotus' DataLens data access technology and comes with drivers for a half-dozen databases, including Borland International, Inc.'s dBase and Paradox, Microsoft's SQL Server and IBM's OS/2 Data Manager and DB2. Release 4 also adds support for Microsoft's Open Database Connectivity specification and its Object Linking and Embedding and Dynamic Data Exchange technologies, which create active links between Windows applications.

On the wireless front, Lotus and SkyTel announced that they would jointly develop a wireless messaging gateway for Notes. The gateway, due out in the third quarter for OS/2 servers, will enable people equipped with SkyTel alphanumeric pagers to receive short messages from Notes users or Notes services.

In other news, Simpact Associates, Inc. of San Diego announced Remark PhoneClient software for Notes, which enables users to create or listen to voice-annotated Notes documents from a push-button phone. Future releases of the software will use synthesized speech technology to read Notes text information to dial-in callers. The package, which contains PhoneClient software and a voice server, costs $2,850.

Action: (510) 521-6190; Lotus: (617) 577-8500; Simpact: (619) 565-1865; SkyTel: (202) 408-7444. ◘

"A company called and said they wanted a new phone system. I said, 'Why?'"

"Sure, it's surprising at first. But 'why' is just one of the many questions we ask to ensure that we completely understand our customers' needs.

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"Simply put, we provide innovative solutions that bring greater value to our customers.

"And it's one of the things that differentiates us in an industry full of companies who just want to sell a 'box' and move on."

Claire-Anne Kinney
Account Manager
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Attachmate acquires Novell 3270 business

continued from page 6

Atlanta, a software developer and a NetWare 3270 LAN Workstation user. "If Novell focuses on the server and Attachmate focuses on the client, unless there's very close communications, the products may get out of sync and we could have incompatibilities.

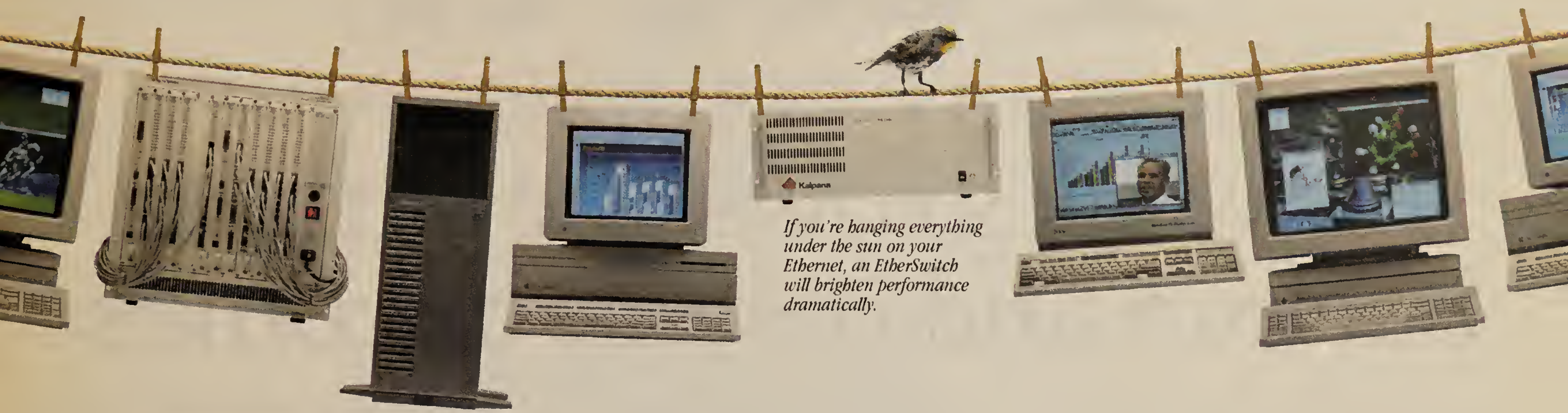
"As a user, I don't see any advantage to this. In fact, if anything, I see a disadvantage," he continued. "If a function is split between two groups that don't have the same set of priorities, there's an opportunity for failure."

The agreement means good news to vendors offering products that compete with NetWare 3270 LAN Workstation.

According to a spokesman from Digital Communications Associates, Inc. in Alpharetta, Ga., current NetWare for SAA customers automatically buy client software from Novell, as well. But now Novell will not offer client software, so customers will be forced to look elsewhere.

"This opens up the market for everyone to get new business that we might not otherwise have had," he said. ◘

WHEN IS A SIMPLE ETHERNET SWITCH SMARTER THAN A ROUTER?


If you're hanging everything under the sun on your Ethernet, an EtherSwitch will brighten performance dramatically.

Things got ugly six months ago when simple CAD drawings took five minutes to download. Now they're taking ten.

New, monster applications. Multimedia. High-speed servers. High-volume transfers between floors and buildings. They've got your network backbone sagging, timeouts multiplying, and response times down to a crawl.

IF THE PROBLEM IS CONGESTION, THE SOLUTION IS BOOSTING THROUGHPUT.

Bridges and routers are designed for protocol isolation, wide area connectivity and connecting dissimilar networks. Kalpana EtherSwitches are designed to boost local network throughput.

A few minutes, a few cables, and EtherSwitch gives you instant Ethernet decongestion.

When you're fighting overloaded local connections, you need to switch.

ETHERSWITCH® IMMEDIATELY ACCELERATES THROUGHPUT BY AS MUCH AS 600%.

Instead of sending single packets one at a time, the EtherSwitch works like a telephone PBX, sending several packets at once on parallel paths.

Suddenly a 10Mbit/s network becomes effectively a 70 Mbit/s network. Peak loads are eliminated and every user gets all the bandwidth they need. All the time.

Those CAD drawings take seconds. Building-to-building conversations happen instantly. Collisions are drastically reduced.

And you don't have to tear anything apart to do it. You just plug in a Kalpana EtherSwitch. It takes five, maybe ten minutes.

You don't have to destroy your existing network structure just to get faster response times.

And it could add that many years to the life of your current network structure.

SIMPLER IS ALWAYS SMARTER.

Unlike routers, an EtherSwitch is truly a plug-and-play solution. There's no software to install or maintain. They're protocol independent. And they automatically recognize all the different equipment on your network.

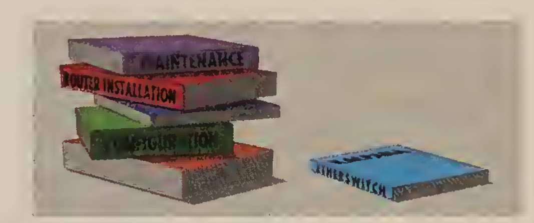
Nothing has to be redesigned, reconfigured, re-routed or re-educated, including your users.

And unlike a router, a Kalpana EtherSwitch doesn't need a crew of people with extensive training to maintain it.

Which is very smart, when you think about it.

ETHERSWITCH IS SIMPLY LESS EXPENSIVE.

About half as much as a router, box-to-box. Plus installation,overhead and re-configuration time for the router, which is considerable, even if you don't count training.



Installing and maintaining a router is no small item.

Installing and maintaining an EtherSwitch is a small item.

AND YOU GET YOUR MONEY'S WORTH OUT OF THE NETWORK YOU ALREADY HAVE.

Instead of waiting for ATM or starting over with FDDI, EtherSwitch gives you the speed you want now with the network structure you already have in place. For a fraction of the cost. You solve your performance problems and put switching technology in place that has a future with ATM.

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The EtherSwitch family includes the five-port EPS 500 and the fifteen-port EPS-1500.

Call Kalpana at **800-488-0775** or 408-988-1900 for a Try'n Buy evaluation unit. Return it within 14 days if you're not completely happy. We'd also be happy to send you a white paper, "How an Ethernet Switch and Multiport Router Compare," or an animated disk that explains Ethernet switching.

So when is a simple switch a smarter choice? Now.

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The more complex your network grows, the simpler backup and restore becomes.

To some it's blasphemy. To others it violates a natural law. The fact is, backup and restore on complex networks can be dramatically simplified. But only with Conner NetWorker™ software. It frees the network administrator because end users perform their own backup and restore. It automates sophisticated tape and file management while preventing accidental or deliberate data loss. It manages and controls all backups from any workstation… even remotes. Multiple backup requests are serviced simultaneously so users can work without waiting. And if you think all this slows it down, think again. Conner NetWorker dramatically increases I/O rates. Running as a NetWare Loadable Module, Conner NetWorker supports up to 250 clients on 26 servers with minimal performance impact and includes automatic fault recovery. It's perfect for networks with ever increasing storage demands. It's perfect for mixed NetWare environments with UNIX, DOS and Macintosh systems. It drives today's most reliable, highest capacity backup devices and loaders from Conner, including Digital Linear Tape (DLT), 8mm and DAT. And now you have security without sacrifice as loader tapes are used by anyone without manual intervention while the administrator controls access to each individually. The larger your network, the more you need Conner NetWorker. It's the simplest, most powerful backup and restore solution for complex networks. And that's a fact.

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DATA NET ARCHITECTURES

NETWORK ARCHITECTURES, DATA NETWORK EQUIPMENT, STANDARDS AND ENTERPRISE NETWORK MANAGEMENT

Worth Noting

Client/server system management tools are an "important element in the rollout of open systems and applications in our business."

Robert Gartland
Managing director
Morgan Stanley Group, Inc.

Data Packets

Pacific Communications Sciences, Inc. (PCSI) of San Diego last week said it added direct access to T-1 and fractional T-1 services, a digital private branch exchange interface and Nx56/64K bit/sec data handling to its CS8000 multiplexer.

The new T-1 and fractional T-1 features eliminate the need for a data service unit/channel service unit, channel bank or T-1 mux to connect the CS8000 to those services. The digital PBX interface allows the mux to mix pulse code modulation streams with compressed voice traffic.

The Nx56/64K bit/sec capability lets users combine multiple voice, facsimile and data transmissions onto any increment of 56K or 64K bit/sec channels, to a maximum of 24 channels, with voice rates as low as 5.3K bit/sec.

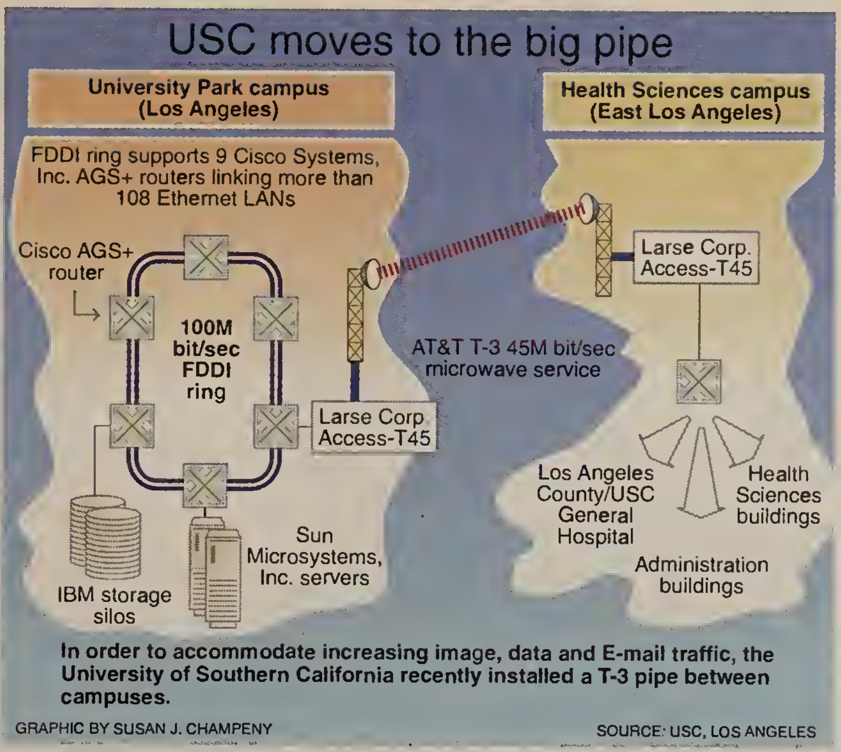
The enhanced CS8000 costs $2,750 and will be available in the third quarter.

PCSI: (619) 535-9500.

Data Race, Inc. of San Antonio, Texas, next week will unveil two dial-up data service units (DSU) intended for use with carriers' switched digital services.

The new Rally S56 Single-Rate DSU/CSU and the Rally S56V Multi-Rate DSU/CSU can transmit synchronous and

(continued on page 21)


USC moves to the big pipe
University Park campus (Los Angeles)
Health Sciences campus (East Los Angeles)
FDDI ring supports 9 Cisco Systems, Inc. AGS+ routers linking more than 108 Ethernet LANs
Cisco AGS+ router
100M bit/sec FDDI ring
Larse Corp Access-T45
AT&T T-3 45M bit/sec microwave service
Larse Corp. Access-T45
Los Angeles County/USC General Hospital
Health Sciences buildings
Administration buildings
Sun Microsystems, Inc. servers
IBM storage silos

In order to accommodate increasing image, data and E-mail traffic, the University of Southern California recently installed a T-3 pipe between campuses.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: USC, LOS ANGELES

New high-speed pipe keeps university traffic moving

Line links campuses, eases bandwidth crunch.

By Michael Cooney
Senior Editor

LOS ANGELES — The combination of a T-3 data service unit from Larse Corp. and Cisco Systems, Inc. routers, outfitted with High Speed Serial Interface (HSSI) boards, has solved a bandwidth crunch problem for the University of Southern California.

Faced with an increasing number of users and new bandwidth-hungry applications, USC recently installed the new equipment at two of its main campuses, giving the university's users access to an AT&T-provided, microwave-based 45M bit/sec T-3 link.

> "We have just about every kind of topology running all sorts of applications."
>
> ▲▲▲

"We have just about every kind of topology imaginable running all sorts of applications and supporting thousands of users, so we can't afford to have constrictions anywhere," said James Wiedel, network manager for USC's department of computing services.

The university installed the T-3 equipment between its downtown campus and a satellite campus in east Los Angeles. Larse Access-T45 Network Service Units connect the Cisco AGS+ routers to the AT&T T-3 circuit at 44.2M bit/sec using the HSSI boards supported by both devices.

HSSI is designed to support transmission speeds from T-1 to over 50M bit/sec.

"The T45 has a second HSSI port that will let us add a second high-speed line if we need to," Wiedel said.

The interworkings

The routers are fed by thousands of Sun Microsystems, Inc. workstations and Apple Computer, Inc. Macintoshes and a variety of other workstations all linked to an extensive Ethernet network. The net also includes a Fiber Distributed Data Interface ring, IBM mainframe and some Digital Equipment Corp. VAXes.

The network handles a variety of applications, from database backup to an on-line medical information service.

One of the most notable benefits of the T-3 link is the main campus, which has a 1G-byte server and houses student information that needs to be backed up every night, a procedure that used to take from "dusk until dawn," Wiedel said. Now, with the faster line, it takes two hours.

"The east L.A. campus has a hospital center that is now start-

(continued on page 21)

Unisys' DCP FEPs boast fault tolerance

The processors use variety of protocols to link LAN workstations to the company's mainframes.

By Jim Duffy
Senior Editor

BLUE BELL, Pa. — Unisys Corp. last week brought out three new front-end processors for its 2200 mainframes that are tailored for high availability, fault-tolerant computing.

The Distributed Communications Processor (DCP) links local-area network-attached workstations and terminals to Unisys mainframes using Unisys Distributed Communications Architecture, IBM Systems Network Architecture, Transmission Control Protocol/Internet Protocol and Open Systems Interconnection protocols.

The new DCP600 line features two models that, for the first time, provide dual partitions, or two functional DCPs in one cabinet. Dual partitions are intended to provide redundancy if one DCP connection fails.

Previously, users had to purchase two DCPs for redundancy.

"There's no single point of failure," said Brian Pickersgill, Unisys program manager for 2200 communications. "Each partition is a self-contained DCP."

Each partition supports 16M bytes of main storage, 80M bytes of mass storage, a diskette, dual power supplies and I/O modules. Two models of the DCP600 line — the DCP624 and the DCP628 — include the dual partitions, while the DCP614 supports one partition but can be field upgraded to a dual-partition configuration.

The DCP614 and DCP624 use four processors per partition. The DCP628 uses eight per partition.

To support the dual partitions, the DCPs also feature intelligent line modules (ILM) that are powered by a Motorola Corp. 68040 microprocessor to offload protocol processing from the DCP. Each ILM also supports two buses that connect the module to both partitions.

The dual-bus ILMs include a Fi-

(continued on page 21)

DSU vendors ready wares with inband mgmt. ability

By Jim Duffy
Senior Editor

Two leading data service unit (DSU) vendors are either shipping, or will soon ship, products that will allow users to manage broadband networks from Simple Network Management Protocol-based consoles.

Digital Link Corp. and ADC Kentrox said they are bundling SNMP agent software with their Switched Multimegabit Data Service (SMDS) DSUs, which will allow the devices to send management data to SNMP consoles over the same lines that transmit other network traffic.

Such "inband" management obviates the need for modems and additional dial-up lines that are used in "out-of-band" management.

"One of the concerns people have when they go to an SMDS network, a connectionless network, is that they've now lost their point-to-point management for their DSU equipment," said Tac Berry, vice president of marketing for Digital Link.

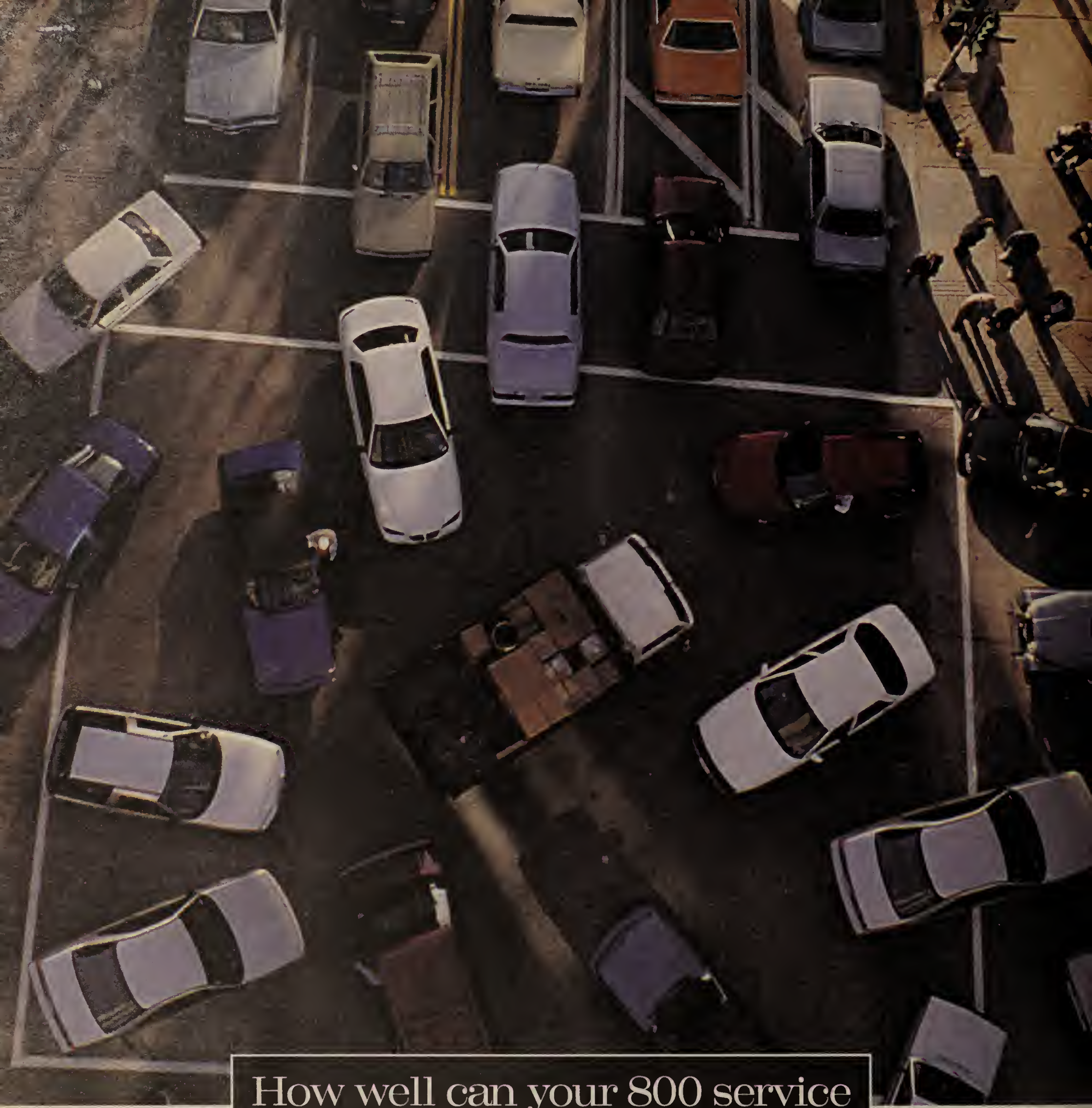
Point-to-point management is inherent in a connection-oriented network where the connection is always nailed up, he added.

Depending on RFC 1209

The inband management schemes of both companies hinge on the Internet Engineering Task Force's RFC 1209 definition for transmitting Internet Protocol packets, including SNMP data, over an SMDS network.

Under RFC 1209, an SMDS DSU is assigned both an SMDS E.164 and an Internet Protocol (IP) address. When the DSU identifies an SNMP polling packet that

(continued on page 21)



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Another Sprint solution allows you to have your incoming calls routed automatically, not only to the nearest call center, but to the next available agent. The result is maximized productivity and minimized customer disconnects.

So if you're in an 800 jam, give us a call. We'll show you how Sprint's 800 solutions can drive up your sales and profitability. And reduce the time your customers spend in traffic.

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LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

Worth Noting

"There has never been a time when there weren't multiple operating systems [from Novell] on the market at the same time."

Gordon Smith
Senior product marketing manager
Novell, Inc.
Provo, Utah

Netnotes

Microplex Systems, Ltd. last week brought out Version 4.0 of its M200 and M201 print servers for Novell, Inc. NetWare and Transmission Control Protocol/Internet Protocol-based local-area nets.

The new version, like the existing one, supports transparent printing over Internetwork Packet Exchange (IPX) and TCP/IP nets. Each provides one parallel port and two serial ports and can be attached anywhere on the LAN.

However, Version 4.0 supports the Simple Network Management Protocol II specifications for more complete and secure network management.

M200 and M201 Version 4.0 will be available in July for $895.

Microplex Systems: (800) 665-7798.

Client connectivity got a boost last week as **The Wollongong Group, Inc.** announced its PathWay client NFS for DOS/Windows product.

Release 2.0 of Wollongong's Network File System client not only provides better performance over the previous version, but now also provides expanded net printing capabilities, enhanced support for CDROM disk drives and support for DOS 6.0.

The Wollongong Group: (415) 962-7100.

Micropolis release to up on-line storage to 93G

Firm's new system provides high-capacity storage.

By Caryn Gillooly
Senior Editor

CHATSWORTH, Calif. — Micropolis Corp. this week is expected to add a new model to its line of Raidion disk array subsystems that supports up to 93G bytes of fault-tolerant storage.

The new Raidion 6040, like the company's existing Raidion line, is a software-based Redundant Array of Inexpensive Disks (RAID) Level 5 subsystem designed to run within Novell, Inc. NetWare 3.11 and 4.0 local-area networks. Unlike other disk subsystems, the Raidion line is software-based, meaning customers can upgrade by simply adding generic Small Computer System Interface disks.

With the new system, for example, the Raidion 6040 can accommodate as many as 32 drives providing a total of 93G bytes of on-line fault-tolerant storage. Before this release, the total maximum storage capacity for the Raidion line was 65G bytes. The new release lets users add storage in 3G-byte increments, whereas the older system could only be increased in 2G-byte increments.

High-capacity needs

Although it may not be commonplace, as more customers move imaging and other storage-intensive applications to LANs, the need for on-line storage — as opposed to data stored off-line in something like a jukebox — is increasing.

One example is JBS Imaging, Inc. of Chicago, a company that buys from the government mortgages and loans that have not been paid off and sells them to investors.

According to Joel Zegart, president of JBS, the company implemented an imaging system last year, and the large number of investors that needed to see files simultaneously ruled out use of a jukebox.

"With a jukebox, you can only look at so many images at once," Zegart said. "We [needed to be

(continued on page 16)

Citrix to provide remote access to Windows apps

By Fredric Paul
Senior Editor

CORAL SPRINGS, Fla. — Citrix Systems, Inc. this week plans to introduce WinView for Networks, a remote LAN access product for users of Windows, DOS and OS/2 text applications.

WinView for Networks runs these applications on the WinView Application Server, sending only screen updates to clients. WinView software on the remote clients provides the user interface.

This concept is similar to remote control software such as Close-Up or PC Anywhere, but WinView for Networks replaces the individual personal computers used for these products with a single server and a bank of modems.

Since the client software delivers the Windows interface without actually running Windows on the remote machine, WinView for Networks supports the huge installed base of low-powered 286 and 386SX desktop and portable PCs already in the field, as well as newer devices such as personal digital assistants that may also lack the horsepower to run Windows effectively. The client must have 1.5M bytes of random-access memory and an enhanced graphics adapter or VGA display, however.

According to Edward Iacobucci, chairman of the 4-year-old company, Citrix's Intelligent Console architecture delivers superior Windows performance via 9.6K bit/sec modems over standard dial-up telephone lines.

That's important, said Jason James, president of ServTech Technologies, a systems integrator in Redwood City, Calif., which is beta-testing WinView for Networks, since "Windows is a big setback for most people doing remote network access." With WinView, ServTech's field sales and

(continued on page 16)

Stitt

Tarrant

NPI, SynOptics lead ANSI draft rollouts

Companies will be the first to ship adapters and hubs based on draft FDDI-over-UTP standard.

By Skip MacAskill
Senior Writer

MILPITAS, Calif. — Network Peripherals, Inc. (NPI) and SynOptics Communications, Inc. last week rolled out the first hubs and adapters that meet ANSI's draft FDDI-over-copper standard.

The new product suites, which were jointly developed by the two companies, conform to ANSI's Fiber Distributed Data Interface-over-unshielded twisted-pair specification, which is expected to be finalized this fall.

"There are two significant aspects to these announcements, one being that the two vendors will be the first to ship products that meet the draft ANSI standard," said Michael Howard, president of Infonetics Research, Inc., a market research firm in San Jose, Calif. "The other is users will have great new pricing that should break down the barriers to FDDI acceptance."

NPI's new adapter offerings include single- and dual-attached versions of various network interface cards supporting all the major bus types, such as AT, Extended Industry Standard Architecture (EISA), Micro Channel Architecture (MCA) and SBus. The new adapters will work with Category 5 unshielded twisted-pair wiring.

The new SynOptics hub line, which will be 100% compatible with the NPI products, consists of a four-port host module for its LattisNet System 3000 intelligent hub as well as a 14-port stand-alone hub.

NPI is using National Semiconductor Corp.'s FDDI chipset but developed the physical media interfaces and bus interfaces on its own, with significant help from SynOptics, said Gordon Stitt, vice president of marketing at NPI.

A beta site user who requested anonymity has been putting the new NPI cards through their paces along with an FDDI-over-copper card from Crescendo Communications, Inc. that does not conform to the standard.

"Our initial analysis has shown that while NPI's adapter did not do as well as the Crescendo card with the smaller 64-byte packets, it far outperformed the Crescendo product in terms of throughput when the larger sized packets were used," the user said. "It's fair to say that testing results based on the larger packets would give a better indication of what a user's real-world performance might be for typical FDDI applications."

The user also noted that Crescendo's card does not scale as well as NPI's model. "When used in the faster machines, Crescendo's card hit the wall and ran out of gas, but the NPI card kept up the pace," he said.

Crescendo last week reaffirmed its intention to deliver standards-based FDDI-over-copper adapters sometime this fall. The new cards are currently in beta test and are expected to address those shortcomings.

NPI's EISA and SBus adapters are available now and cost be-

(continued on page 16)

NPI, SynOptics lead ANSI draft rollouts

continued from page 15

tween $995 and $2,495. The AT and MCA cards will be available in June within the same price range.

The new SynOptics gear includes the Model 3905 FDDI UTP Host Module, which is compatible with all existing 3000 products and supports Category 5 connections to single-attached devices. Available in July, it costs $3,750.

The new Model 2915 FDDI UTP Workgroup Hub is a 14-port stand-alone device that supports 12 Category 5 ports and two fiber-optic connections. It also supports single-attached devices and dual-homing of critical FDDI end nodes. Available in July, it costs $9,995.

"Besides the server cluster application, FDDI over UTP is a good fit for a high-performance work group doing a variety of bandwidth-intensive applications such as engineering, computing and computer-aided design," said Peter Tarrant, group manager of local-area network connectivity products at SynOptics.

Some users viewed the debut of the FDDI-over-copper products with mixed emotions. "The good thing about FDDI on copper is it's going to cause the whole industry to buckle and bring pricing down for real FDDI," said Michael Broyles, network engineer at Fluor Daniel, Inc., a construction firm in Greenville, S.C. "[But] we would not seriously consider it — at least on our server ring — because when you go to copper, you immediately lose a lot of the fiber advantages."

NPI: (408) 321-7300; SynOptics: (408) 988-2400.

Micropolis release ups on-line storage

continued from page 15

able to let] people look at up to 20,000 images at once. The only way to do that is through hard drives."

According to Zegart, JBS started with a Raidion system with 27G bytes of storage then increased that number to 57G bytes, which was the equivalent of about 800,000 images. Now the company needs the capacity to provide as many as 3 million images on-line.

"We've talked to Micropolis about becoming a beta site [for the 6040]," Zegart said, to help accommodate the company's growing image inventory.

The Raidion 6040 is expected to be available at the end of this month for $16,980 for a 6G-byte array. Additional 3G-byte drive modules will cost $5,660.

Micropolis: (818) 709-3300.

Citrix to provide remote access

continued from page 15

service personnel are doing just about anything they would do sitting at a workstation in the office, James said.

The WinView Application Server is a 32-bit, preemptive multitasking, multiuser operating system that can support as many as 10 simultaneous remote sessions on a 486-class PC, Iacobucci said, even more on an Intel Corp. Pentium machine. It is 100% compatible with DOS, he said, allowing up to 600K RAM per application and supporting both extended and expanded memory.

Source code licensed from Microsoft Corp. lets WinView for Networks users run Windows 3.1 applications as well as DOS programs and OS/2 text applications. Links are also available to local- and wide-area network clients running on Novell, Inc. Internetwork Packet Exchange (IPX), IPX/Sequenced Packet Exchange (SPX) or Network Basic I/O System.

A built-in back-end interface to Novell NetWare and Microsoft LAN Manager provides remote users with their own "virtual connection" to the network, Iacobucci said. In addition to working the LAN security system, WinView has its own multilevel systems security, logon and password protection. It also supports session shadowing, session disconnecting and automatic session recovery.

At ServTech, WinView for Networks for Windows is running on a 50-MHz 486 computer with a VESA local bus interface. Remote users run the applications off the server, and also use the system to connect to the company's NetWare 3.11 LAN.

WinView for Networks can also use external communications servers to work over the local network, so network administrators can use it to support Windows on older PCs and diskless workstations. Administrators can extend these capabilities to WANs via routers.

WinView for Networks is available now in packs for five or 10 concurrent users, priced at $1,995 and $2,645. Additional five-user packs cost $695. A version for Windows NT will be available next year, Iacobucci said.

Citrix Systems: (800) 437-7503, (305) 755-0559.

FYI Now you can back up a hemisphere of LANs from your home office.

Our powerful system for centrally attended backup lets you bring everything back to your data center in spite of the number, distance or dissimilarity of your LAN systems.

You can do full or incremental backup of workstations and servers worldwide, either simultaneously or individually, scheduled or ad hoc, in batch or interactive mode, at transfer rates of up to 30 GBytes/hr.

Your LAN users will retain all the features they expect—including user-initiated backup, remote search for single or multiple files by date or date ranges, and volume retrieval from local tape.

Your host can be MVS, VM, VMS or UNIX; your media and protocols TCP/IP, NETEX, DECnet, Token Ring, Novell, FDDI, Ethernet, HYPERchannel or 3270 terminal emulation.

The name of our centrally attended backup system is USER-Access with Central Archiving. And for your information, you can call 1-800-338-0122 for:

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WINNER

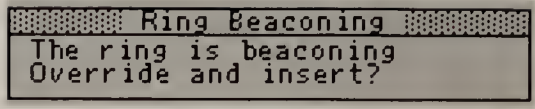
COMNET

NEW PRODUCT ACHIEVEMENT AWARD

A new, faster way to stay on top of your Token Ring.

FLUKE.

Pinpoint network problems in seconds.



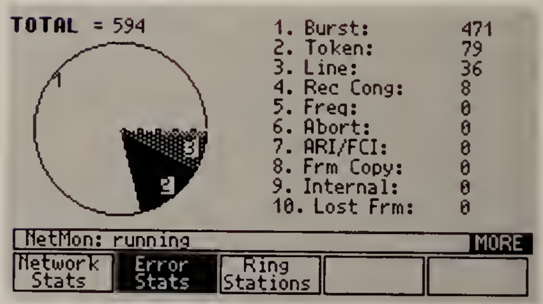
```
The ring is beaconing
Override and insert?
```

Beaconing rings. Push one button, and in seconds the LANMeter will insert into a beaconing ring and automatically identify the fault domain. No more wading through screens of decodes.

Bad connectors. Instantly identifies cable faults all the way down to the connector.

File server not found. These four words can ruin your whole day. Hook-up the LANMeter in Expert-T mode and find out where the problem resides: in the PC, cable or MAU.

Misconfigured stations, bridges, or routers. Buffers too small? Using inefficient routes? Too much traffic to one server? Use the LANMeter's comprehensive set of network statistics, graphic error and usage analysis, response time testing, plus fault domain reporting of soft errors, broadcasts, and traffic to isolate and



```
TOTAL  = 594
                    1. Burst:          471
                    2. Token:          79
                    3. Line:           36
                    4. Rec Cong:       8
                    5. Freq:           0
                    6. Abort:          0
                    7. ARI/FCI:        0
                    8. Frm Copy:       0
                    9. Internal:       0
                   10. Lost Frm:       0
NetMon: running
```

troubleshoot those problems.

Bad or marginal network interface cards. Attach the LANMeter to a suspect station, run the NIC tests, and LANMeter will verify the NIC's ability to enter a ring. Prevent problems by using this test *before* attaching a new station to an operating ring.

Overloaded server. The LANMeter's pie chart shows you which station is eating up too big a slice of the server.

Duplicate local or remote addresses. Without the LANMeter, this could take hours to isolate. Use the Expert-T or real-time soft-error analysis to solve this problem.

Too-long cables? Only the LANMeter *automatically* detects the presence of self-shorting connectors and tells you the correct distance — so you don't have to remember to calculate it yourself.

Station inserts at wrong speed. Hook-up the LANMeter between a suspect station and MAU. It will tell you the ring speed and station speed. If they don't match, the LANMeter prevents the station from bringing down your ring. And, you'll really appreciate this feature: The LANMeter detects the ring speed and *automatically* inserts at the correct speed so it never brings down your ring.

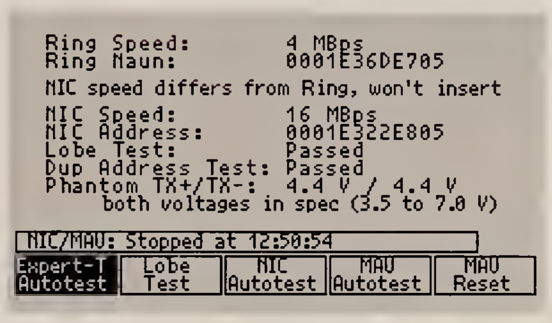
Noisy cables. In real-time, the LANMeter's soft-error pie chart points out *where* the problem is in the network. Then, you can use the cable tests to find out *why* it's bad.

Stuck MAU ports. This "headache" can bring down an entire ring. The LANMeter will not only test for this, it'll reset the MAU port and then verify it was fixed.

Slow response time. Is your LAN too busy? Too many ring errors slowing network throughput? The LANMeter's graphic display lets you immediately see exactly how busy your network is, plus which types and sources of soft errors are bogging down performance.

Noisy MAU. This problem most often surfaces as excessive phase jitter. The LANMeter is the only tool that can measure it.

Excessive broadcast traffic. The LANMeter instantly identifies who is sending which kind of broadcast traffic.



```
Ring Speed:          4 MBps
Ring Naun:           0001E36DE705
NIC speed differs from Ring, won't insert
NIC Speed:           16 MBps
NIC Address:         0001E322E805
Lobe Test:           Passed
Dup Address Test:    Passed
Phantom TX+/TX-:     4.4 V / 4.4 V
     both voltages in spec (3.5 to 7.0 V)
NIC/MAU: Stopped at 12:50:54
```

Ring works at 4 Mbps but not at 16 Mbps. Is there a problem in a single cable or the entire ring? The LANMeter gives you several ways to solve this one. Use the LANMeter to isolate the culprit. Then use the lobe test to determine if that station's cable is capable of handling 16 Mbps traffic. Or could it be your ring jitter is out of spec? Only the LANMeter can tell you.

Miswired connectors. The LANMeter's wiremap test will tell you exactly how each cable is wired.

Tools for Healthier LANs

FLUKE®

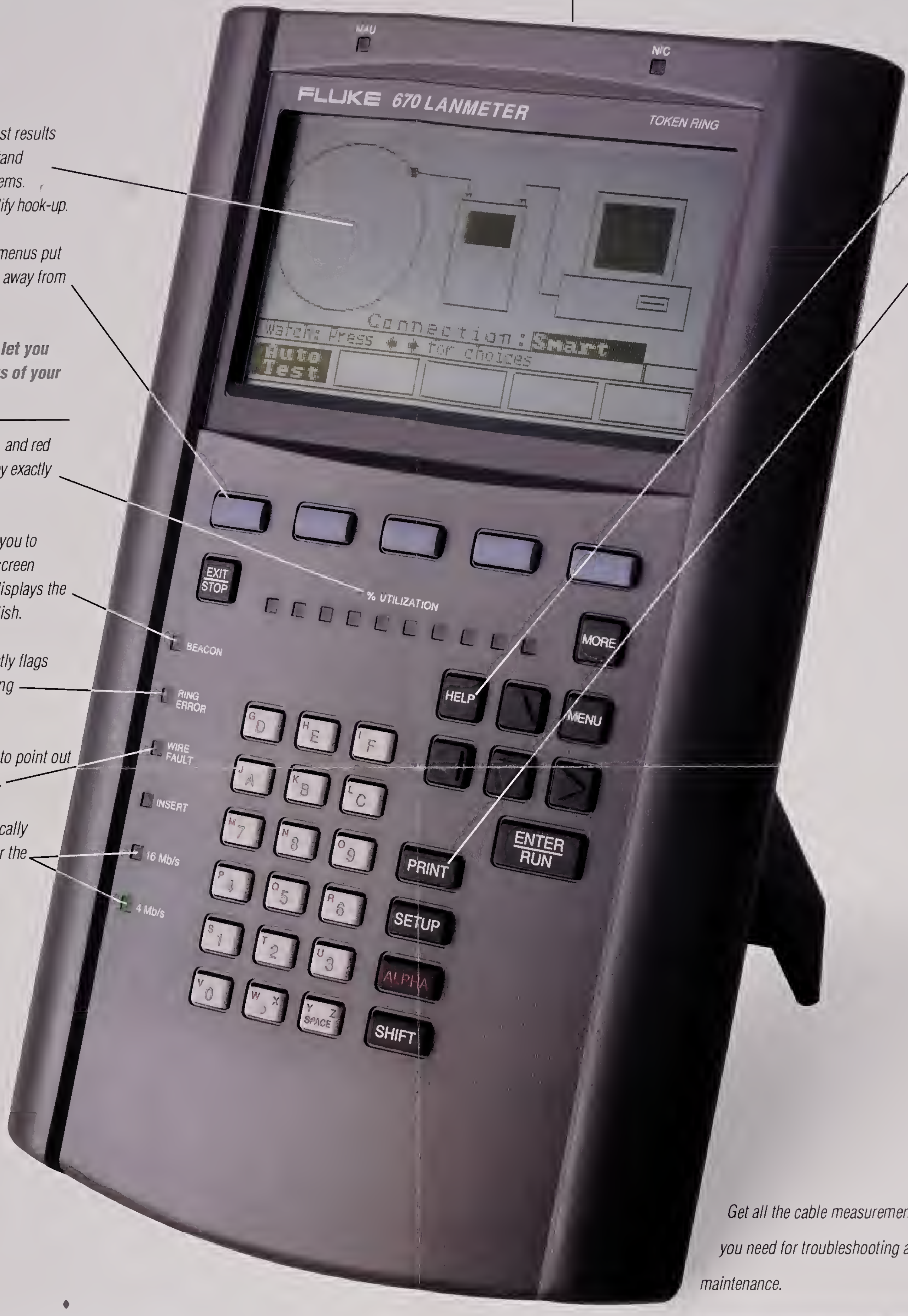
Fluke TOKEN RING LANMeter™

NEW

No more searching for "special" adapters. The LANMeter has built-in RJ45 and DB-9 connectors for quick connections to Type 1 and Type 3 cabling systems.

Get integrated cable and network measurements with one tool.

Test your network by connecting the LANMeter to your ring like you would any other station ...or connect the LANMeter between a suspect station and the network and it will automatically isolate a problem to the station, cabling, or network.



Graphic presentation of test results helps you quickly understand and isolate network problems. Connection diagrams simplify hook-up.

Simple two-level softkey menus put you just a few key strokes away from test results.

LAN-At-A-Glance LEDs let you instantly see the status of your Token Ring network.

*Color-coded green, yellow, and red **UTILIZATION** LEDs convey exactly how busy your network is.*

*Red **BEACON** LED alerts you to beaconing, while the on-screen Beacon Pop-up window displays the fault domain in plain English.*

***RING ERROR** LED instantly flags errors that affect Token Ring performance.*

***WIRE FAULT** LED lights to point out faulty connection to MAU.*

***RING SPEED** is automatically determined, lighting either the 4 Mbps or 16 Mbps LED.*

*Extensive context sensitive **HELP** text includes troubleshooting advice.*

*Attach the LANMeter to a printer and press **PRINT** for a hard copy of your test results.*

"Flash ROM" technology means that as software enhancements become available, you can download new firmware through the serial port in just a few minutes.

LANMeter's Unique Features:

- ***LAN-At-A-Glance LEDs***
- ***Expert-T Autotest***
- ***Automatic insertion at correct ring speed***
- ***Phase Jitter Measurements***
- ***Real-Time Graphic Analysis***
- ***Simultaneous Key Measurements (stats, stations, errors)***
- ***"No Dead Zone" TDR Measurements***
- ***NIC/MAU Tests***
- ***Automatic Identification of New and Missing Stations***

yes
It runs with NetWare

Shown Actual Size
29.2 cm (H) X 16.3 cm (W) X 5.6 cm (D)
[11.5 in. (H) X 6.5in. (W) X 2.2 in. (D)]

The handheld, battery-powered LANMeter goes directly to where there's a problem, not just where there's an electrical outlet.

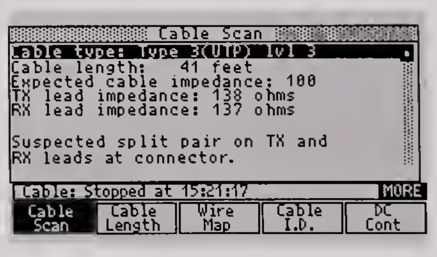
Get a grip on network problems instantly.

Fluke's compact, self-contained LANMeter automatically points you to a Token Ring fault — whether it's in your software, cabling, network interface, configuration, or PC. *Even* on sick or dead networks. All without programming, setting filters, or decoding complex protocols. It performs in seconds and only takes 30 minutes to learn.

Simply grab it and go, avoiding time-consuming tests with multiple tools. The LANMeter's real value is not just helping you quickly *react* to problems but instead helping you proactively *maintain* a healthier network. Insert it into your ring to find out where efficiency is bogging down. And head off problems *before* they happen. When a problem does occur, the LANMeter's graphic display makes it easy to visualize exactly where it is. So you can take immediate action to correct it.

Get more performance out of your network by getting your hands on the tool with more features for less than *one-third* the price of a dedicated protocol analyzer. The new LANMeter from Fluke. **Call today for a revealing on-site demo and our FREE pocket guide to Token Ring healthcare. Phone numbers listed on back.**

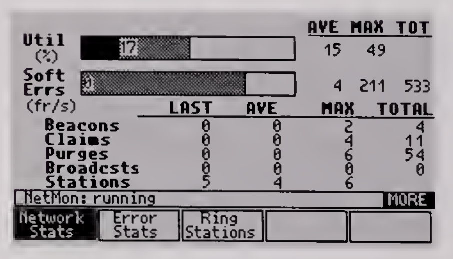
Get all the cable measurements you need for troubleshooting and maintenance.



```
Cable Scan
Cable type: Type 3(UTP) lvl 3
Cable length:    41 feet
Expected cable impedance: 100
TX lead impedance: 138 ohms
RX lead impedance: 137 ohms

Suspected split pair on TX and
RX leads at connector.
Cable: Stopped at 15:21:17           MORE
Cable Scan | Cable Length | Wire Map | Cable I.D. | DC Cont
```

The Fluke LANMeter gives you the most-used functions of protocol analyzers - without the learning curve.



```
                              AVE MAX TOT
Util    17                     15  49
(%)
Soft    0                       4 211 533
Errs
(fr/s)          LAST   AVE    MAX  TOTAL
  Beacons        0      0      2     4
  Claims         0      0      4    11
  Purges         0      0      6    54
  Broadcsts      0      0      0     0
  Stations       5      4      6
NetMon: running                      MORE
Network Stats | Error Stats | Ring Stations
```

By combining these capabilities, the Fluke LANMeter is the <u>one</u> tool for the vast majority of your troubleshooting needs.

Tools for Healthier LANs

FLUKE®

Free

Simply call for an "eye-opening" demo of the LANMeter in action and our special Pocket Guide.

Learn handy pointers on how you can use the LANMeter to improve the health of your Token Ring network:

- where to start, and how to proceed in identifying trouble spots in your Token Ring network
- what network statistics are important for creating a baseline network evaluation
- how to obtain those statistics using the LANMeter
- how to verify node connectivity and configuration *before* your network is affected
- detailed troubleshooting chart of 13 common isolating and non-isolating token ring errors. Each error is broken-down by:
  - ☐ when the error is normally generated
  - ☐ when the error should cause alarm
  - ☐ what usually causes this type of error
  - ☐ where to look for the source of the problem
- technical description of various cable measurements and how they apply to LAN cabling, plus a glossary of LAN terms.

John Fluke Mfg. Co., Inc.
P.O. Box 9090
Everett, WA 98206

T&M Dept., BuildingTQIII-4
5600 MD Eindhoven, The Netherlands
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INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

> "The toughest thing to do with ATM is drop it down to the desktop because it requires changes to the desktop, and, as FDDI found out, it's not something people are willing to do."
>
> **John Hart**
> Chief technical officer
> 3Com Corp.
> Santa Clara, Calif.

Link Notes

InterLAB, an independent network test lab and consultancy, next month will hold its second annual conference on "the new SNA" that will address key issues involved in migrating IBM nets onto enterprise internet backbones.

IBM and other router, hub and Systems Network Architecture gateway vendors will detail their corporate strategies for this migration.

The conference will be held in New York June 8-9.

InterLAB: (800) 836-4081.

Bytex Corp. last week announced third-party service agreements with General Electric Computer Service and Toronto-based PC Service-Partners, Inc. whereby both will provide technical support for Bytex's Series 7000 Intelligent Switching Hub.

Standard Microsystems Corp. (SMC) has joined the Interoperability Lab Token Ring Consortium, a cooperative venture between the University of New Hampshire and several internetworking vendors that seeks to foster compatibility in multivendor environments through independent testing of compliance with IEEE 802.5 standards.

INTERNETWORKING MONITOR

BY SCOTT BRADNER

Security panacea may be key to restful slumber

One of the most basic problems in the computer and networking biz is the inability to get assured data.

I don't mean statistics, such as how many packets a router has sent since last Thursday, but more simple things, like knowing how the new version of the router software you picked up via the File Transfer Protocol (FTP) over the Internet really came from the router vendor.

Is that configuration file your router retrieved via Trivial File Transfer Protocol the one that the network manager edited? Is the security bug fix you retrieved from the bulletin board a Trojan horse that opens more holes than it closes?

Currently, there is no common way to ensure the authenticity of origin of the many file types we use to configure and run our systems and networks, nor is there any way to validate that they have not been surreptitiously modified. It's enough to keep a body awake at night — if we stopped ignoring the effects of unwanted changes to these files.

Network World addressed this in a special issue on security (April 12, page 43). One technology described in that issue would go a long way toward allowing a good night's sleep — even if the problem is not being ignored.

The creator of a particular file — whether it contains a program, configuration or data — could add a digital signature to it. You could then easily obtain complete assurance that the file had not been modified since the digital signature was created. You also could be sure who creat-

(continued on page 19)

Router module debuts for Xyplex Network 9000 hub

By Maureen Molloy
Senior Editor

BOXBOROUGH, Mass. — Xyplex, Inc. last week announced a new router module for its Network 9000 Intra-networking Hub that will enable users to create Ethernet subnets without sacrificing LAN interface slots.

The Network 9000 220 Hub/Router module lets users segment bandwidth for small work groups, boosting the bandwidth available to each end user while keeping costs at about $250 per port, said Peter Nesbeda, Xyplex's president and founder.

The module takes advantage of the Network 9000 hub's Multi-Media Midplane architecture. Unlike a typical hub, where the backplane is in the rear of the chassis, the Network 9000's 290M bit/sec bus is in the center and divides the hub's processor functions from the I/O functions (*NW*, Sept. 28, 1992, page 17).

Users can install an Ethernet 10Base-T module in an I/O slot and the new 220 Hub/Router in a processor slot but configure it to block traffic from crossing the mid-plane to other components. This approach confines local traffic while passing along only those packets destined for other Ethernets supported by the hub.

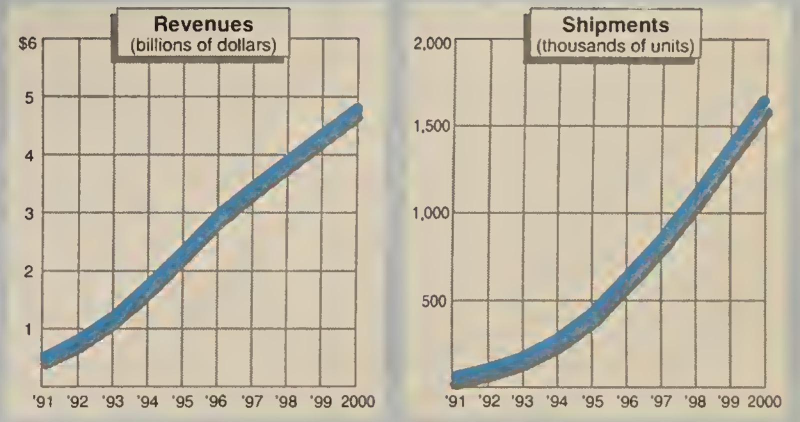
Segmenting a net this way also boosts reliability by confining failures and faults to the segment on which they occur.

The module is a two-port Ethernet router, with one port

(continued on page 19)

The billion-dollar hub

Intelligent hub market forecast



Terming the intelligent wiring hub as "one of the most significant network products of the decade," Business Research Group predicts the market for those hubs will expand from $833 million last year to nearly $3 billion by 1996.

GRAPHIC BY ANNE GIANCOLA

SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.

Sync pack shores up IBM mgmt. functions

Provides new capabilities that let SNAC pass data to NetView with IBM front-end processors.

By Maureen Molloy
Senior Editor

IRVINE, Calif. — Sync Research, Inc. recently unveiled operating software that adds new IBM-compatible management capabilities to its line of Systems Network Architecture SDLC converter products.

With the release of 9.0, Sync will now provide features that enable its SNA Network Access Controller (SNAC) to feed IBM-compatible performance statistics and modem management data to IBM's NetView net management system via an IBM front-end processor (FEP).

SNACs let remote Synchronous Data Link Control-based devices attach to token-ring local-area networks by converting SDLC data into token ring's Logical Link Control 2 (LLC2) format. This enables SDLC data to flow through a router and over the same wide-area lines as multiprotocol LAN traffic, obviating the need for separate but parallel SDLC links to a host FEP.

According to Lynn Nye, Sync's director of product marketing, the new software enables users to retain the sophisticated IBM management functions they are accustomed to as they migrate to router-based backbones.

New capabilities

The new SNAC management features allow an operator at a NetView, System Center, Inc.'s NetMaster or Sync's own SNAC/Man net management console to cull more detailed management information from the SNAC device.

The first feature provides NetView Performance Monitor-like statistics that enable users to better gauge network performance by monitoring items such as traffic flow and utilization of SDLC lines and SNAC processors.

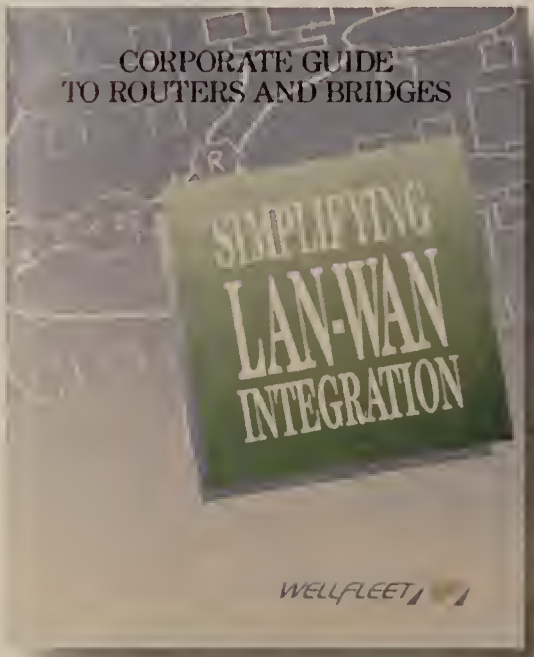
> The management features allow an operator to cull more detailed information.
>
> ▲▲▲

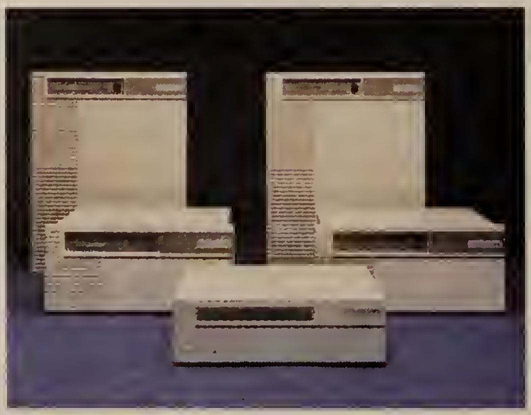
The second feature includes support for IBM's Link Problem and Determination Aid-2 (LPDA-2) modem management, which is an IBM management application that monitors IBM data service units (DSU) and modems and reports back to NetView.

Support for LPDA-2 enables the SNAC to test downstream SDLC lines and issue dial-out commands to a modem. The net operator can download a new

(continued on page 19)

You've Really Got To Hand It To Any IS Professional Who Wants To Understand LAN/WAN Integration.





After all, internetworking is a challenging subject – especially if it's not your primary focus. Fortunately, Wellfleet has produced a comprehensive guide that removes the mystery from internetworking. The guide is perfect for anyone who wants to gain a more thorough understanding of routers and bridges, communications protocols, internetwork design and cost-justification, and selection criteria. Call **1-800-989-1214, Extension 9** for a free copy, or to send a complimentary copy to a colleague. Whether you're an internetworking expert or novice, it's sure to come in handy.

WELLFLEET
communications

When Your Networks Are Complex, Your Choice Is Simple.

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Sync pack shores up IBM mgmt. functions

continued from page 17

configuration and telephone number to a remote SNAC or reestablish a connection to a remote site via the public net if a leased line malfunctions.

In traditional SNA nets, Nye said, FEPs are used to poll SDLC lines and configure modems on an SDLC line. Prior to the new software release, once the SNAC was introduced into the net, the FEP lost visibility to the modem.

Bruce Lee, a senior network analyst at San Diego Gas & Electric Co. who is currently migrating his SNA devices onto token-ring LANs, said he is interested in the Sync device because of its LPDA-2 management capabilities.

"Our current SDLC network is supported primarily with IBM DSUs and modems, and it's critical that I maintain the diagnostic capabilities that I have now with NetView," he said.

The new software is available now as a free upgrade on the vendor's entire line of converters, including the SNAC, miniSNAC and Central Site SNAC (formerly the SNAC-FEP).

Sync: (714) 588-2070. ◼

Router module debuts for Xyplex 9000 hub

continued from page 17

linked directly to the Ethernet repeater on the I/O module and the other to any one of the three Ethernet segments on the midplane of the hub. The hub/router supports Apple Computer, Inc.'s AppleTalk, Digital Equipment Corp.'s DECnet, Novell, Inc.'s Internetwork Packet Exchange (IPX) and the Transmission Control Protocol/Internet Protocol. It also supports the Spanning Tree Algorithm, as well as the Routing Information Protocol and the Open Shortest Path First routing protocols.

Xyplex also announced an optional version of the hub/router that provides port-level security. The 221 Hub/Router reads the address of each packet and forwards a legible packet only to the port to which it is addressed. All other ports will receive a scrambled packet.

The 220 Hub/Router costs $3,750, and the 221 Hub/Router, which includes the security option, is priced at $4,250. Both are available now.

Xyplex: (508) 264-9900. ◼

Security panacea key to restful slumber

continued from page 17

ed the file. For example, Proteon, Inc. could include a digital signature with the copy of a router's system software upgrade in an anonymous FTP directory so that when the file is retrieved, the signature would be checked. Once the signature was verified, you could be sure the file came from Proteon and had not been modified.

This technique would be useful in personal computer virus checkers. Microsoft Corp. could include a digital signature with Microsoft Word diskettes and give its public key to virus checker vendors. Using the public key, the virus checker would almost instantly verify that the copy of Microsoft Word had not been infected.

There is one problem with this approach, however. Some PC software modifies files to insert custom information, such as the user's name, making the signature invalid. However, the custom information could be moved into a separate file or into a portion of the program file that is not included in the digital signature.

> Digital signatures would prove useful, but they cannot help people who use their first name as a password.
>
> ▲▲▲

Unfortunately, there is a dearth of products that use digital signatures this way. One can only hope that they start showing up soon as a standard.

Digital signatures may sound like a panacea, but they are only one part of an overall security strategy. They would prove useful in a number of instances, but they cannot help people who use their first name as a password, which leaves their system open to easy attack.

Digital signatures can be an additional tool to help build a secure environment, but good procedures are the building blocks and common sense is the mortar. ◼

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

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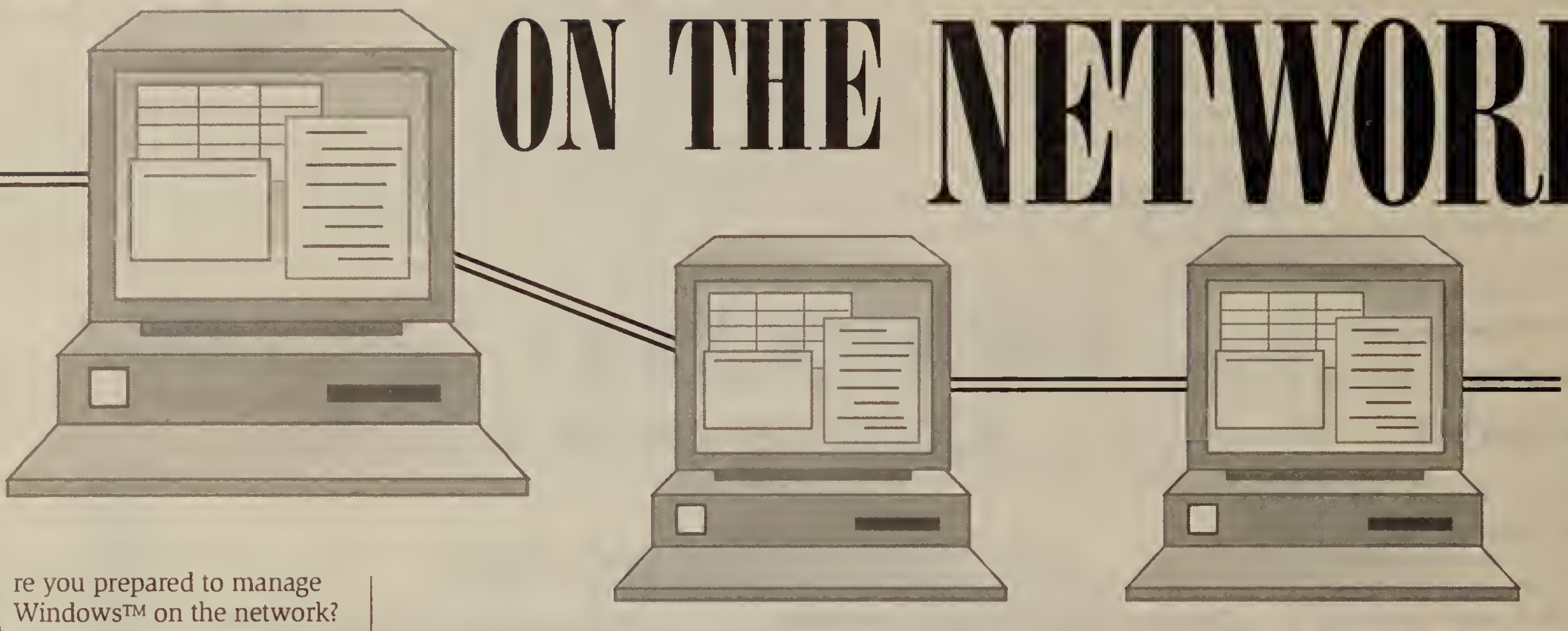
MANAGING WINDOWS™ ON THE NETWORK



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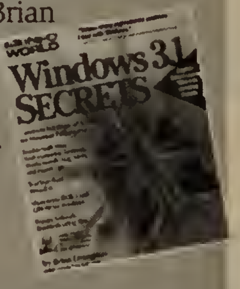

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Unisys' DCP FEPs boast fault tolerance

continued from page 13

ber Distributed Data Interface, Ethernet and token-ring card, and RS-232/V.24, V.35 and X.21 interfaces that support speeds from 19.2K to 2M bit/sec.

The LAN modules each support one port, and the token-ring card supports shielded or unshielded twisted-pair media. The wide-area network boards sport from four to eight ports.

Should an ILM fail, the DCPs support an interface to a matrix switch for maintaining physical connectivity.

In the future, Unisys will offer Integrated Services Digital Network, frame relay, Switched Multimegabit Data Service, Asynchronous Transfer Mode and Synchronous Optical Network interfaces on the DCP600.

The DCP600 line is compatible with existing members of the DCP family, according to Unisys.

The company is also offering a Windows-based personal computer, called the Control Station, which network managers can use to conduct path control, monitor line conditions and perform diagnostics on the DCPs.

The DCP614 costs $248,000, and the DCP624 costs $273,000. Both are available now. The DCP628 costs $323,000 and will be available in December.

Unisys: (215) 986-4011.

Data Packets

continued from page 13

asynchronous data. The Rally S56V supports speeds from 1,200 to 57.6K bit/sec, while the Rally S56 supports only 56K bit/sec links.

The Rally S56 costs $595, and the Rally S56V costs $795. Both are available now.

Data Race: (210) 558-1900.

Digital Communications Associates, Inc. last week added support for Novell, Inc.'s NetWare for SAA LAN-to-host gateway to its IRMA Workstation for Windows 3270-emulation program. The IRMA NetWare Workstation for Windows will let DCA users link to IBM hosts via the NetWare for SAA gateway.

The firm also promised to deliver similar capabilities in the future for its DOS and Apple Computer, Inc. Macintosh clients.

Individual IRMA Workstation for Windows programs will be available in June for $395. Multipacks for 10, 50 and 100 users will be available for $3,195, $9,195 and $15,195, respectively.

DCA: (800) 348-3221.

High-speed pipe keeps traffic moving

continued from page 13

ing to send medical images over the pipe, which is something we couldn't do efficiently before," he said. The main campus also keeps an on-line medical information database that doctors can access 24 hours a day.

"Throughput was really our overriding problem," Wiedel said. "With the T-3 installed, we virtually eliminated complaints about poor response time and any of the problems we were having with bandwidth availability."

A cost-saving issue

The high-speed equipment USC installed will also save the university money in the long run, he added. The school considered installing more T-1 links and possibly a high-speed fiber-optic link between the campuses.

"The T-3 equipment turned out to be the most cost-efficient solution, and we should be able to grow with it," he said.

DSU wares readied with inband mgmt.

continued from page 13

has an SMDS E.164 address, it looks at the data within that packet for the IP address that identifies the DSU.

The DSU responds to the SNMP poll with an E.164-addressed alarm or alert, which is interleaved with payload data, such as from a router.

"This allows users to essentially do all the control and performance management of [SMDS DSUs] using inband methods," said Rick Gilbert, vice president of engineering for ADC Kentrox.

Availability

Digital Link will introduce the new capability in its T-3 DSU later this month. It will be provided in the company's T-1 and E-1 DSUs in June, Berry said.

ADC Kentrox will demonstrate its inband management capability at INTEROP 93 in August and ship software in September, Gilbert said.

Digital Link: (408) 745-6200; ADC Kentrox: (503) 643-1681.

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"And ensuring peace of mind for our customers is our National Customer Support Center. Through 24-hour systems monitoring, diagnostics, and trouble clearing, the Center identifies and corrects many problems remotely.

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Sequent

Sponsored By:

DCI

A3ZQWN

Lexmark announces laser printers with the most intelligent feature ever:

Lexmark announces the next generation of laser printers. With the built-in intelligence to adapt to your needs today. And grow with you tomorrow.

The intelligent abilities of the new IBM LaserPrinter 4039 family by Lexmark are powerful enough to impress the most serious user. And economical enough to impress the most serious accountant.

Intelligence.

A family of five highly intelligent printers that deliver 10, 12, or 16 pages per minute. And a cost/value equation that sets a brilliant new industry standard.

There are five new LaserPrinters, for 10, 12 or 16 page-per-minute printing. Each has a fast-thinking RISC processor. A compact, space-saving footprint. And an optional snap-on duplexing attachment, for the lowest-priced two-sided laser printing in the industry.

PCL5 and PostScript® compatibility are built in—saving you up to $775 over competitive machines. And delivering plug-and-play compatibility that won't disrupt the way you're printing now. SmartSwitch is built in, too—so your LaserPrinter can choose the right language for each job, automatically.

Sharp, 600-dpi resolution is standard, with Print Quality Enhancement Technology (PQET) for smoother curves. So is PictureGrade,™ for sharper halftones.

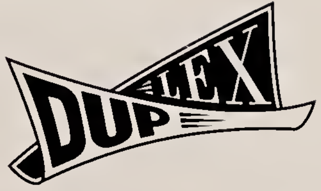
Intelligent memory management lets two megabytes do the work that used to take four. That saves you money.

Drivers for popular software packages are included, along with Lexmark's special driver for faster Windows™ printing. So is

THE NEW IBM LASERPRINTER 4039

Lexmark's Quick Start utility, to choose and load the right drivers, automatically. That saves you time.

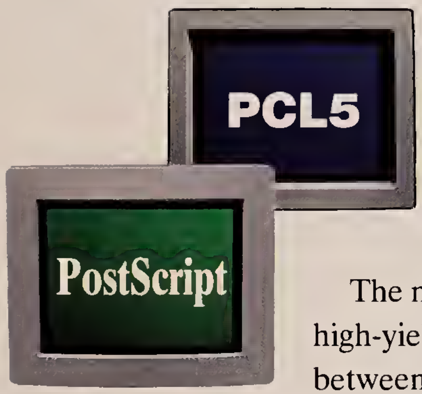
And a large, intuitive operator display makes installation and use even easier.



An optional duplexing attachment fits every printer in the series. Because saving paper and file space is just plain smart.

Inside your LaserPrinter, upgradable code lets you add new capabilities as they become available, without buying a new printer. Optional flash memory lets you store frequently used forms, logos, and fonts permanently—yet change them instantly.

For LAN users, Lexmark's optional Internal Network Adapter (INA) cards work effortlessly with multiple network operating systems, *simultaneously*. You can even update INA software remotely. Bi-directional communication lets a network manager check on printer status from across the LAN. And the LaserPrinter connects simultaneously to serial, parallel, and optional network inputs, for maximum flexibility.



Right out of the box, the new LaserPrinter is compatible with your working environment, whether you use PCL5 or PostScript.

The new LaserPrinters share multi-size paper trays, and high-yield Lexmark print cartridges, for up to 20,000 pages between changes.

And each one reflects the simple design philosophy of Lexmark, the independent, worldwide company formed from a division of IBM: listen to what customers want. Then build it for them. And stand behind it with quality, support, and responsiveness.

For your nearest Lexmark dealer, call 1 800 358-5835 (in Canada, 1 800 663-7662). For more information, just look inside.

And see why you really don't need bigger, more expensive, more complex laser printers. Just smarter ones.

Select an optional INA card, and you're compatible with multiple operating systems—simultaneously.

IBM Personal Printers by

LEXMARK™

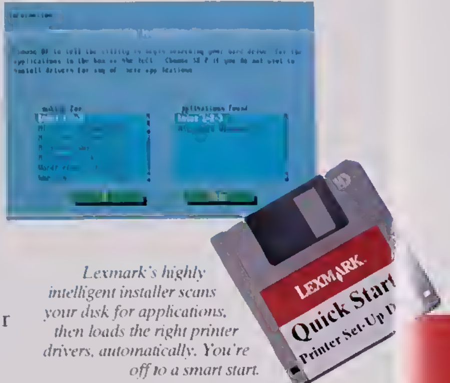
Make Your Mark

FAMILY, BY LEXMARK. PRINT SMART.

Exactly how smart are Lexmark's new laser printers?

Smart enough to do things the only intelligent way: yours.

From the moment you plug it in, the new IBM LaserPrinter 4039 accommodates you—not vice versa. Compatibility with PostScript and PCL5 is built in—something other printers charge as much as $775 for. So is SmartSwitch—to automatically select the right language for each job. And Lexmark's Quick Start installer and printer utilities make set-up brilliantly simple. And adding new fonts and drivers even simpler.



Lexmark's highly intelligent installer scans your disk for applications, then loads the right printer drivers, automatically. You're off to a smart start.

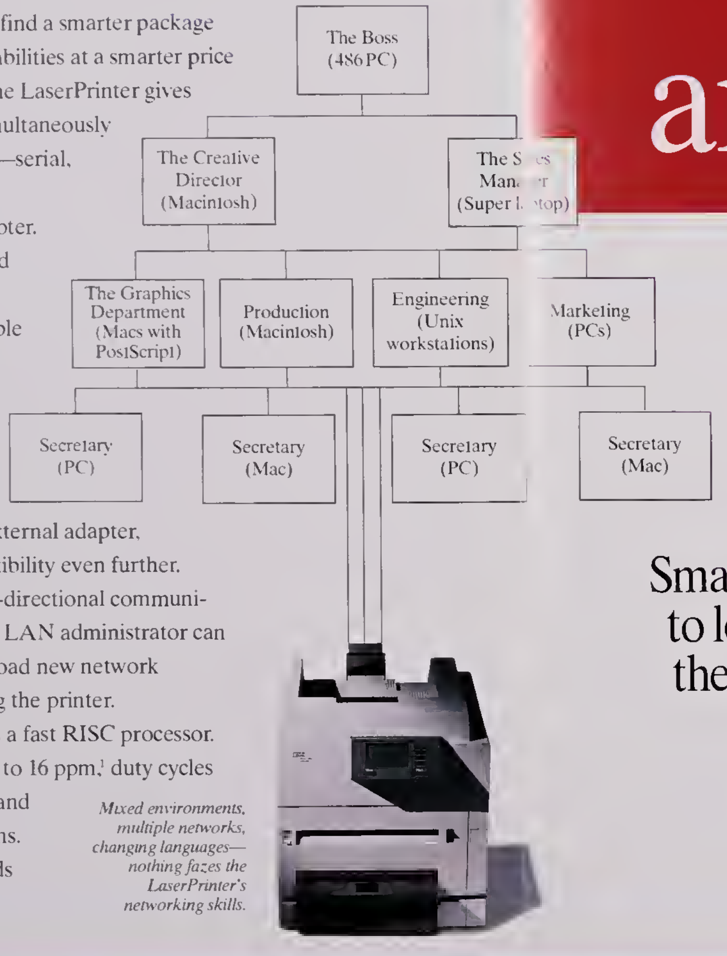
Smart enough to adapt to every corporate culture.

You won't find a smarter package of LAN capabilities at a smarter price anywhere. The LaserPrinter gives you three simultaneously active inputs—serial, parallel, and optional internal network adapter.

Choose an optional INA card (Ethernet or Token-Ring) and you're simultaneously compatible with Novell® NetWare® OS/2® LAN Server, Microsoft® LAN Manager, *and* AIX®—all on one card. AppleTalk cards are available for Macintosh networks, too. Add our 4033 external adapter, and you expand your LAN flexibility even further.

Lexmark INA cards have bi-directional communications, and flash memory, so a LAN administrator can check printer status and download new network software, without ever touching the printer.

Every LaserPrinter 4039 has a fast RISC processor. And you can choose speeds up to 16 ppm,[1] duty cycles up to 75,000 pages per month, and powerful paper-handling options. Because LAN printing demands brawn as well as brains.

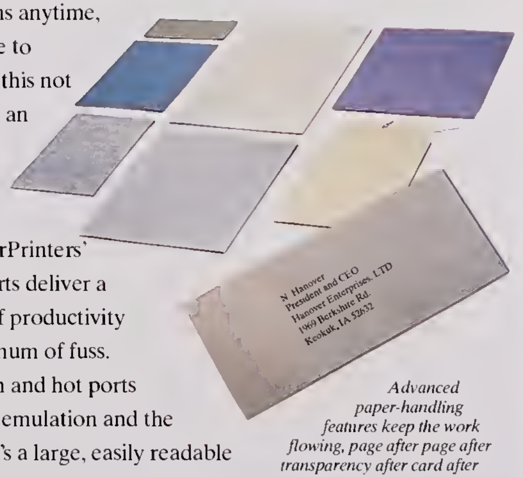

The Boss (486 PC)
The Creative Director (Macintosh)
The S es Man r (Super l top)
The Graphics Department (Macs with PostScript)
Production (Macintosh)
Engineering (Unix workstations)
Marketing (PCs)
Secretary (PC)
Secretary (Mac)
Secretary (PC)
Secretary (Mac)

Mixed environments, multiple networks, changing languages—nothing fazes the LaserPrinter's networking skills.

As intelligent as they are, they get even smarter.

Not only is your IBM LaserPrinter on the cutting edge today. It's smart enough to stay there tomorrow. Its internal code is easily upgradable—so you can add new capabilities without paying for a whole new printer. Optional flash memory lets you store frequently used forms, custom fonts, and logos for faster printing—yet change them as often as you like. You can add or change paper-handling options anytime, and move them from machine to machine. All of which makes this not just an intelligent printer. But an intelligent investment.

With our Registered Users Program, you can add new capabilities, without buying a whole new printer.



Advanced paper-handling features keep the work flowing, page after page after transparency after card after envelope after...

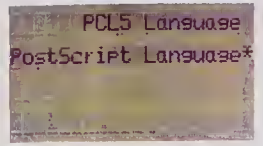
Smart enough to look after themselves.

The LaserPrinters' built-in smarts deliver a maximum of productivity with a minimum of fuss. SmartSwitch and hot ports automatically select the right emulation and the right port for each job. There's a large, easily readable menu-driven control panel (though the LaserPrinter is so automatic, you may never touch it).

Bi-directional communications let LAN administrators check on the printer's status remotely. Auto paper-size sensing and multi-size trays handle all kinds of paper—even card stock and transparencies. Lexmark's exclusive Envelope Conditioning[2] fights unsightly wrinkles. And every new LaserPrinter ships with a high-yield Lexmark print cartridge—saving you $25 to $100 over the competition.

With all these conveniences, just about the only time you'll make a trip to this printer is to pick up your finished documents.

PostScript emulation and PCL5 emulation are built in. Saving you up to $775 over some other printers.

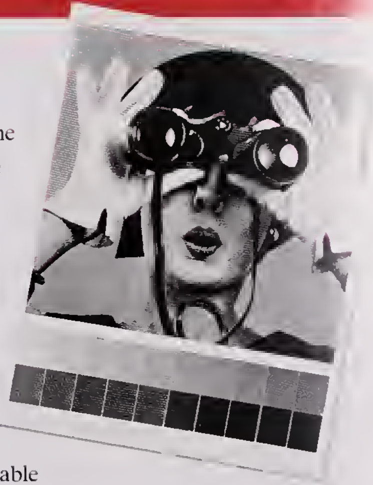


```
      PCL5 Language
PostScript Language*
```

Who says intelligence and good looks don't go together?

Smart as they are, the new IBM LaserPrinters excel in the beauty department, too. True 600-dot-per-inch resolution is standard, with Print Quality Enhancement Technology (PQET) to sharpen text and graphics, and fight the dreaded jaggies. Lexmark's advanced toner technology delivers rich blacks and excellent print quality, without ghosting. 39 Type 1 scalable fonts, 13 scalable Intellifonts,® and 14 bitmapped fonts are all standard.

So is PictureGrade—Lexmark's new technology for maximizing the smoothness and sharpness of images, with up to 100 shades of gray. Which simply means your scanned-in images and photographs will always look exceptionally smart.



Introducing PictureGrade: for sharper, smoother images with up to 100 shades of gray.

Smart enough to see environmental issues from both sides.

Two-sided printing is the wave of the future—so it's an option on every IBM LaserPrinter 4039 today. A compact, efficient duplexing unit attaches in seconds, to put the intelligence of duplexing wherever you need it.

But saving paper is just the beginning. An automatic power saver mode saves electricity while your printer is idle. Lexmark's new print process is ozone free. Lexmark print cartridges last longer, so you'll use fewer. And their cartons double as prepaid return mailers—so you can return used cartridges to Lexmark's Operation ReSource. It wouldn't be an intelligent printer without an intelligent respect for the environment.

Two-sided printing saves paper, storage space, money—and wear and tear on the environment.

Lexmark's 20,000-page print cartridges keep productivity high — and cost per page amazingly low.

PRINTERS THAT THINK. FROM A COMPANY THAT LISTENS.

These new LaserPrinters were designed with the intelligence to anticipate your needs, and respond. So was the company that created them: Lexmark International. Two years ago, we took a former division of IBM, transformed it into a fully independent company called Lexmark, and rededicated ourselves to the art of listening. Customers told us they needed laser printers to do more and cost less. So we built the new LaserPrinter family to establish new industry benchmarks in performance. And, just as important, in value.

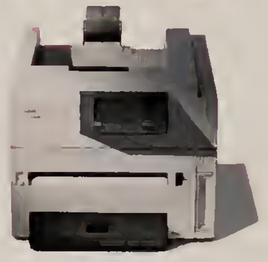
IBM Personal Printers by
LEXMARK
Make Your Mark

Obviously, intelligence runs in the family

Model 10R
Highly intelligent, highly economical desktop printing. _Includes all standard features, plus: 10 ppm; 16 MHz AMD 29200 RISC processor; 2MB memory; 25,000-page-per-month duty cycle; 200-sheet paper tray; 250-sheet output tray; free one-year carry-in service. Includes 10,000-page print cartridge._ **_$1599._**

Model 10R Duplex
The lowest-cost solution for 2-sided printing. _Same as Model 10R, bundled with snap-on duplexing module for the lowest-cost two-sided printing in the industry. Includes 10,000-page print cartridge._ **_$2199._**

Model 12R
High-performance desktop printing. _Includes all standard features, plus: 12 ppm; 16 MHz AMD 29200 RISC processor; 4MB memory; 35,000-page-per-month duty cycle; 200-sheet paper tray, 250-sheet output tray; free one-year carry-in service. Includes 10,000-page print cartridge._ **_$1999._**



Model 12L
For high-volume LAN printing. _Includes all standard features, plus: 12 ppm; 16 MHz AMD 29200 RISC processor; 4MB memory; 50,000-page-per-month duty cycle; 500-sheet input tray, 500-sheet output tray with bin-full sensing; free one-year on-site service. Includes 10,000-page print cartridge._ **_$2899._**

Model 16L
Maximum performance for the busiest LANs. _Includes all standard features, plus: 16 ppm; 20 MHz AMD 29000 RISC processor; 4MB memory; 75,000-page-per-month duty cycle; 500-sheet input tray, 500-sheet output tray with bin-full sensing; free one-year on-site service. Includes 20,000-page print cartridge._ **_$3399._**

One of the smartest features of Lexmark's newest LaserPrinter family is its breadth. And every model, for about the same price as printers that offer less, delivers an array of very intelligent standard equipment:

PostScript and PCL5 compatibility
SmartSwitch printer language sensing
High-speed, AMD 32-bit RISC processor
Compact footprint
Up to three simultaneously active input ports: parallel, serial, and optional INA card
600 and 300 dpi resolution, both with Print Quality Enhancement Technology
PictureGrade enhancement for scanned-in images
Quick Start installation software and printer utilities
Intelligent, efficient memory management
Accelerated driver for faster Windows printing.

Interchangeable options include low-cost duplexing attachment, flash memory, INA cards with multiple operating systems, advanced paper-handling options.

One more family trait: the IBM LaserPrinter series comes to you from Lexmark, an independent, worldwide company that develops, manufactures, and markets IBM personal printers, IBM typewriters, related supplies, and keyboards. To find your nearest dealer, or for more information, call 1 800 358-5835 (in Canada, 1 800 663-7662).

IBM Personal Printers by
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[1] 600 dpi throughput is generally determined by page complexity, with a maximum of 8 ppm. [2] Available on 12 and 16 ppm models. MSRP. Dealer prices may vary. IBM is a registered trademark of International Business Machines Corporation in the U.S. and other countries and is used under license. AIX and OS/2 are registered trademarks of International Business Machines Corporation. AMD is a registered trademark of Advanced Micro Devices, Inc. PostScript is a registered trademark of Adobe Systems Incorporated. AppleTalk and Macintosh are registered trademarks of Apple Computer, Inc. Novell and NetWare are registered trademarks of Novell Inc. Lexmark and PictureGrade are trademarks of Lexmark International, Inc. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation. Intellifont is a registered trademark of Miles Inc. © 1993 Lexmark International, Inc.

THE NEW IBM LASERPRINTER FAMILY, BY LEXMARK. PRINT SMART.

GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

Worth Noting

Private-line service revenues in the U.S. will inch ahead from $9.46 billion this year to $9.83 billion in 1996 before beginning a slow decline, according to a recent report from Frost & Sullivan Market Intelligence, a Mountain View, Calif., research firm.

Carrier Watch

MCI Communications Corp. last week announced that it has been selected to operate one of J.P. Morgan & Co.'s global communications networks under a five-year contract valued at $80 million. MCI teamed with **Infonet Services Corp.**, in which it owns a 25% stake, to win the coveted deal.

Under the agreement, the duo will migrate voice, data and video traffic from J.P. Morgan's existing 20-site global private network to dedicated MCI links in the U.S., Asia and Latin America. European traffic will run over Infonet's existing shared pan-European network.

As part of the outsourcing agreement, MCI will supply global network design and management service, facility provisioning, integrated billing, and global customer service through support centers and service teams located around the world, as well as guaranteed service-level agreements.

MCI will provide net services to J.P. Morgan locations in the U.S. as well as in Argentina, Australia, Belgium, Brazil, Canada, France, Germany, Hong Kong, Italy, Japan, Mexico, Singapore, Spain, Switzerland and the U.K.

PacBell launches a new 800 marketing offensive

Looks to reduce 800 rates, revamp its discounts.

By Bob Wallace
Senior Editor

SAN FRANCISCO — Pacific Bell last week outlined a campaign designed to help it retain existing toll-free service users while winning converts from the Big Three.

Pacific Bell has asked the California Public Utilities Commission for permission to reduce 800-service rates, revamp its volume discount structure and free up new 800 prefixes.

"The 800 market is a highly competitive one with 22 800-service providers in our state," said Roy Peacock, 800 product manager for Pacific Bell. "We want to make sure that we're the premier 800-service provider."

Pacific Bell has asked state regulators to approve a 10% across-the-board price reduction for its Custom 800 service, the carrier's flagship 800 service that supports more advanced routing features than its Full-State, Half-State, Service Area and Metro intra-local access and transport area 800 services.

If the plan is approved, Custom 800 users would be able to qualify for discounts quicker, with Pacific Bell dropping its discount threshhold from 25 hours of monthly usage to 10 hours, Peacock said. "We want to pull in many more low-end businesses."

The Bell operating company has also proposed adding discount steps for large Custom 800 users. Today, the carrier offers service at $7 an hour after 1,000 hours per month. The proposed new steps are $5.50 an hour after 2,500 hours of usage and $4.50 after 5,000 hours.

Pacific Bell also wants to begin enabling users to combine traffic to different 800 numbers for the largest volume discounts. "A company with 200 different 800 numbers would qualify for huge volume discounts," Peacock said.

In addition, Pacific Bell is freeing up more than 100 800 prefixes, a move that will give customers more variety and choice of numbers.

Pacific Bell also said that it has opened a dedicated 800-service center in Pasadena, Calif., that combines marketing and customer service functions in a 24-hour, seven-day-a-week operation.

Pacific Bell: (415) 542-9000.

LCI 800 plan gives users discounts and flexibility

By Bob Wallace
Senior Editor

DUBLIN, Ohio — LCI International last week announced a new toll-free service that lets users that spend up to 50,000 per month take advantage of discounted rates without signing term plans.

With the carrier's 800 Service Select Option, users receive volume discounts based on usage without monthly minimums or penalty for fluctuating service use.

"By using this divergent approach, we're making our service more attractive than AT&T, MCI and Sprint services," said Jon Finceth, director of business market planning for LCI. "And we're confident that once they come aboard, users will stay with us."

With some of LCI's more established competitors, the only way to attain volume discounts is to sign a long-term pact.

"We fully understand that 800 portability brings with it more options," Finceth said. "We know that users want to keep their options open, so we decided that getting them in a hammerlock with term plans isn't what's best."

In addition, with term plans come minimum monthly usage levels that users must meet to avoid paying penalties. "Users often feel locked in with term plans," Finceth said.

The LCI service has eight discount levels, ranging from 12% for users spending $2,500 a month to 17% for those spending more than $15,000 per month.

LCI is offering additional dis-

(continued on page 34)

The wide gaps between user and carrier prices

(Cost per database lookup in cents)

Carrier	Carrier price	Carrier cost	User proposed price
Amenitech	0.22	0.16	0.15
Bell Atlantic Corp.	0.309	0.1651	0.15
BellSouth Corp.	0.40	0.16	0.15
Nynex Corp.	0.419	0.1174	0.15
Pacific Telesis Group	0.59	NP	01.5
Lookup at SCP	NP	0.068	NP
Lookup in tandem	NP	0.1299	NP
Southwestern Bell Corp.	0.31	NP	0.15
US West, Inc.	0.35	NP	0.15
GTE Telephone Co.	1.0	0.2413	0.15
Southern New England Telephone Co.	0.44	NP	0.15

NP = Not provided SCP = Signal Control Point

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: LOCAL CARRIER TARIFF FILINGS STUDY AND ECONOMICS AND TECHNOLOGY, INC., BOSTON

Rates may deter use of 800 portability

Some users list pricing, handoffs between carriers as current issues that may rob portability of benefits.

By Anita Taff
Special to Network World

Despite a flurry of activity among users waiting at the gates to switch carriers when 800 portability took effect May 1, many report that nagging questions about administrative and pricing issues are keeping them on the sidelines.

Just over 60% of large users in a *Network World*/TeleChoice, Inc. survey said they are not currently considering switching 800 carriers. And of the roughly 40% who said they were considering a switch, only about 10% have actually decided to make the move (*NW,* May 3, page 1).

Most of the major technical concerns about portability have been resolved, including Signalling System 7 interconnections between local and long-distance carriers and possible performace delays due to database look ups. These concerns were great enough that last year the Federal Communications Commission pushed back the 800-portability deadline 60 days.

"Our main concerns are not related to quality of service; now our questions are about the administration and pricing of service," said Leland Fong, business manager for Visa International, Inc. "We think the physical changes [in carriers' networks] have been done with some reasonable level of comfort, but, unfortunately, the adminstrative issues are what's going to kill us," Fong said.

Consequently, Visa International has adopted a wait-and-see attitude, Fong said. "We are not going to jeopardize our [800] business if there is any risk."

George Sparks, manager of technology and planning at Baxter Healthcare Corp., echoed those concerns.

"We want to see the network stabilize and see how well [800-portability] management works before diving in," he said. "We really have a wait-and-see attitude," Sparks said.

Chief concerns expressed by users are pricing of new features and handoffs between carriers when traffic is switched. Many users fear that if these issues are not worked out quickly and decisively, many of the benefits of 800 portability will be wiped out and true competition for 800 service may be undermined.

Portability will allow users to switch 800 traffic to a new carrier while retaining the toll-free number familiar to their customers. Users will have access to a number of new routing options that allow them to split traffic among carriers at different times of day or week, or by geographic area. These features will help control costs, balance traffic and aid in backup and disaster recovery.

One of the concerns users cite most is the cost of using new por-

(continued on page 24)

Rates may deter use of 800 portability

continued from page 23

table 800-number features. Local carriers filed tariffs laying out the charges for these features in March, setting off a fire storm of controversy over wide disparities in price from carrier to carrier and what many users said were excessive rates.

A typical user concern was a petition filed at the FCC by National Data Corp. (NDC).

"Although National Data welcomes number portability, it is concerned that the pending tariff revisions [for database lookup charges], if allowed to go into effect, will totally offset the benefits of increased 800-service competition," NDC told the FCC in a filing.

NDC, which has a substantial amount of 800 traffic supporting transaction processing applications, said that if the proposed charges are allowed to take effect, its 800-communications costs would increase between 6% and 114%.

The wide range is attributed to discrepancies in proposed rates charged by local carriers each time they perform a basic lookup of an 800 number in a database. The rates range from a low of 0.22 cent proposed by Ameritech to a high of 1 cent proposed by GTE Telephone Co. (see graphic, page 23).

The per-lookup rate is important because the long-distance carrier to whom the call is routed must pay the local carrier for each database query. Long-distance carriers said that if the rate is too high, they will be forced to pass some of that charge to the end user.

Users and long-distance carriers said it is impossible for local carriers to justify the proposed rates because the carrier's own data submitted to the FCC shows that the cost of a database lookup ranges from 0.1174 to 0.2413 cent per attempt.

Many users were so alarmed by the rates that they filed a formal petition asking the FCC to throw out the local carrier tariffs. Despite user concerns, the FCC refused to impose an interim rate and allowed the carrier charges to take effect. However, the FCC did place the rates under investigation, and, if it is determined that the rates are excessive, refunds are possible.

But that will not help users in the short term. It could take as long as a year for the FCC to sort through the pricing questions, according to Ellen Block, partner at Levine, Block and Lagapa, a Washington, D.C. firm that counsels financial services users on telecommunications.

"Unfortunately, users have to make decisions right now based on these horrible rates," Block said.

Among the users that had protested the local carriers' rates were NDC, the Ad Hoc Telecommunications Users Committee, the International Communications Association (ICA) and a group of financial users comprised of the California Bankers Clearing House Association; MasterCard International, Inc.; The New York Clearing House Association and Visa USA, Inc.

The group of financial users told the FCC that, based on their usage of 800 numbers, the proposed rates could mean a 20% increase in overall costs for some members' 800 calls.

The financial services group — along with the Ad Hoc Committee, ICA and NDC — submitted an economic study to underscore their concerns. The study, which was prepared by Economics and Technology, Inc., a Boston-based research firm, says the database lookup charge should be no more than 0.15 cent per attempt.

More problems with pricing cropped up for users recently when AT&T filed a tariff seeking to charge 0.5 cent per 800 call attempt for customers that split 800 traffic between AT&T and one or more other carriers. The 0.5 cent per call would be as-

(continued on page 34)

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The Reader Advocacy Force (R.A.F.) tackles the tough issues facing our readers — the buyers of network products and services. As consumer advocates, we want to hear about any problems you've encountered with products, service and support, or interoperability of equipment, as well as any other concerns you have. We'll investigate your tip, and if we write about it, we'll send you a T-shirt emblazoned with the *Network World* R.A.F. logo. You can contact us via the R.A.F. hot line at (800) 622-1108, Ext. 487, on the Internet at nwraf@world.std.com or through the R.A.F. Forum on our electronic Bulletin Board System (BBS). For instructions on using the BBS, see page 5.

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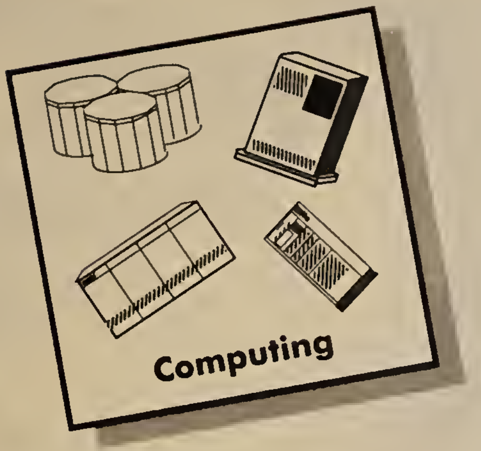

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Worth Noting

> "A lot of people feel they are stuck between technology and business. Upper management views us as wild technologists, while vendors see us as conservative reactionaries trying to throw water on their parade."

Bob Marcus
Founder of the Corporate Facilitators of Object-Oriented Technology
Coordinator of object-oriented technology
Boeing Computer Services
Bellevue, Wash.

Store & Forward

Borland International, Inc. has formed a new Client/Server Division responsible for research, development and marketing of its development tools, middleware and server products for client/server nets.

Borland: (408) 438-8400.

Uniface Corp., a vendor of fourth-generation language client/server application development software, last week announced an interface driver for Borland International, Inc.'s InterBase database.

Uniface also launched a program to support value-added resellers.

Uniface: (800) 365-3608.

Raima Corp. has announced Raima Database Server, an SQL database for personal computer local-area networks. It will support Microsoft Corp.'s Open Database Connectivity specification and run on DOS, NetWare, OS/2, Unix and Windows servers. Pricing starts at $1,995.

Raima: (206) 557-0200.

IBI, KnowledgeWare join forces in client/server mart

Partnership formed to integrate firms' products.

By Bob Brown
Senior Editor

SAN FRANCISCO — Information Builders, Inc. (IBI) and KnowledgeWare, Inc. announced a partnership at the recent DB/EXPO '93 here under which they will integrate their products.

Under the agreement, KnowledgeWare will integrate its computer-aided software engineering (CASE)-based Application Development Workbench (ADW) tool with IBI's Enterprise Data Access (EDA)/SQL data access software. KnowledgeWare will also develop two EDA/SQL-based products: Model/EDA and ADW/Construction Workstation (CWS)-EDA.

Model/EDA will enable applications developed using ADW to access multiple data sources by allowing an exchange of information between EDA/SQL and ADW data repositories. EDA/SQL's repository contains information regarding the whereabouts of data on the network as well as logical schema information.

CWS-EDA will enable programmers to build applications using ADW's CASE development tools that have IBI's EDA/API embedded in them. The EDA/API provides a link between applications and EDA/SQL Server, which gives access to over 50 databases.

ADW can now access a limited number of data sources.

"This agreement will help make KnowledgeWare more visible in the client/server market, where it is moving aggressively," said Wayne Kernochan, director of commercial systems research at Aberdeen Group, Inc., a consulting firm in Boston.

Model/EDA and ADW/CWS-EDA will be available in the third quarter. Pricing has not been set.

Separately, IBI announced support for Tandem Computers, Inc.'s NonStop servers. EDA/SQL client software for Tandem computers will be available in June, and server software will be ready in the fourth quarter. Server software will range from $8,000 to $188,500, while client software will cost $175 to $350.

IBI: (212) 736-4433; KnowledgeWare: (404) 231-3510.

UniSQL offers upgraded database, related products

By Bob Brown
Senior Editor

AUSTIN, Texas — UniSQL, Inc., based here, last week announced Version 2.0 of its UniSQL/X relational and object-oriented database, a product that provides access to multivendor databases and an object-oriented development tool.

UniSQL/X 2.0 for IBM AIX, Sun Microsystems, Inc. SPARCstations and scalable processor architecture-compatible workstations includes a host of new features, including support for two-phase commit and multithreaded transaction processing, and more SQL92 features and SQL3 draft features.

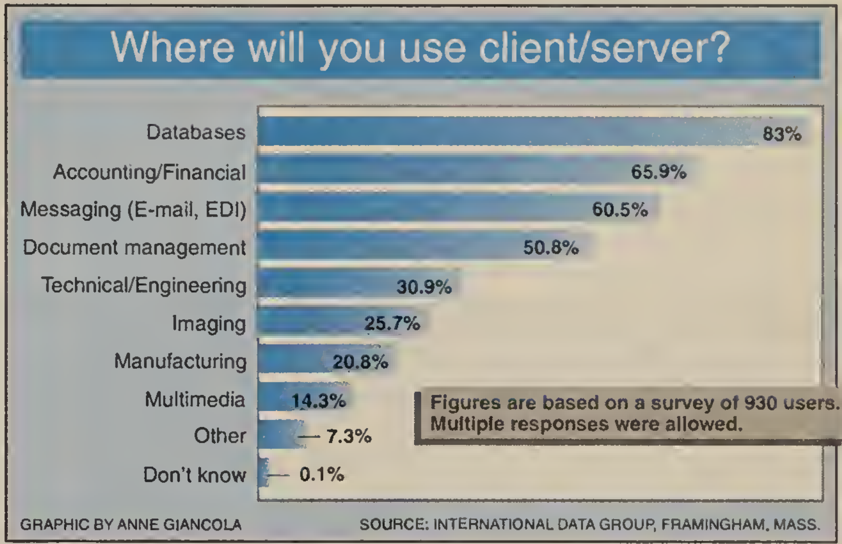
The new UniSQL/M Multidatabase System takes the database schemata of multiple databases and blends them into a single schema, said Al D'Andrea, UniSQL's director of sales and marketing. The first version will support Ingres, Oracle Corp., Sybase, Inc. and UniSQL databases. Future versions will support IBM's DB2 and nonrelational databases from IBM and Digital Equipment Corp.

D'Andrea

UniSQL will also introduce UniSQL/4GE ObjectMaster, an application development tool kit.

UniSQL/X 2.0 costs $3,995 and is available now on Sun Solaris 1.1 platforms, with support for IBM AIX and Hewlett-Packard Co. HP/UX platforms coming in July. UniSQL/M also costs $3,995 and is available on Sun and IBM platforms. UniSQL/4GE ObjectMaster is priced starting at $1,795 and is available for Sun workstations, with HP and IBM support due soon.

UniSQL: (512) 343-7297.



Figures are based on a survey of 930 users. Multiple responses were allowed.

GRAPHIC BY ANNE GIANCOLA
SOURCE: INTERNATIONAL DATA GROUP, FRAMINGHAM, MASS.

Group helps users see forest through trees

Mission is to weed through overgrowth of product claims to help identify technologies that really work.

By Wayne Eckerson
Senior Editor

BELLEVUE, Wash. — Information technology advances so rapidly that few organizations are well equipped to effectively evaluate, let alone integrate, the technologies on the market today.

One ad hoc electronic group is trying to help users sift through the morass of products and vendor double-talk to identify technologies that deliver real value.

The Corporate Facilitator of Object-Oriented Technology (CFOOT) is a group of 250 Internet users who share ideas and information about emerging products and technologies.

"We try to keep ahead of the trade press about what is going on [with new technology] and what products are really available and working," said Bob Marcus, a coordinator of object-oriented technology at Boeing Computer Services here and founder of CFOOT, which boasts suscribers from Citibank, N.A., Deere & Co., Electronic Data Systems Corp. and other large corporations.

The group also tries to encourage vendors, many of whom are subscribers to the CFOOT Internet mailing list, to deliver technology that can be easily integrated with legacy systems, which provides a well-defined payback. "There is a big gap between what vendors provide and what users really need and want," Marcus said.

While focused on emerging object-oriented technologies, CFOOT keeps abreast of any technology that may meet users' business requirements. About 1½ years ago, for example, Marcus said he recognized that interapplication messaging software would play a significant role in helping companies build distributed applications.

He collected material about this new class of software — dubbed middleware, or asynchronous messaging software — and vendors active in the area, then electronically distributed the information to CFOOT subscribers. That raised members' awareness of the technology and brought to the surface a number of users that had built their own asynchronous messaging software or were using commercially available middleware products.

"It was quite obvious from discussions among CFOOT members that asynchronous messaging as a class of products was catching on more quickly than was apparent through the media," Marcus said.

While CFOOT tries to bring unheralded technologies and products to members' attention, it also tries to unearth the real status of products and the progress of standards groups. "We try to provide a reality check about technology and products," said Marcus, who initiates most topics discussed by CFOOT members.

A rock and a hard place

Marcus said most CFOOT members view themselves as mediators between vendors with new technologies and information systems (IS) departments

(continued on page 28)

Cognos, SES put new networking wares on display at DB/EXPO '93

By Bob Brown
Senior Editor

SAN FRANCISCO — Cognos, Inc. showed a new version of its Impromptu database query tool and Scientific and Engineering Software, Inc. (SES) released a new client/server network modeling tool at DB/EXPO '93 here last week.

Cognos, based in Burlington, Mass., introduced Impromptu 2.0, a version of the company's desktop SQL data access product that includes integrated query and report writing capabilities and access to a broader range of databases.

The software enables end users to build reports directly from queried data, rather than requiring them to slip into a separate reporting module. Data manipulation is also easier because Impromptu 2.0 supports Microsoft Corp.'s Object Linking and Embedding and Dynamic Data Exchange application integration specifications, and it features a configurable tool bar that lets users call various applications from Impromptu.

Impromptu also supports more data sources today, with direct support for Microsoft, Oracle Corp. and Sybase, Inc. database servers, as well as Borland International, Inc. dBase and Paradox desktop databases. It also supports Microsoft's Open Database Connectivity (ODBC) specification, which lets it access ODBC-compliant databases and products.

In addition, the new software includes a shared catalog, Impromptu's repository of predefined database joins and rules. Previously, the catalog resided only on each client, making catalog updates unwieldy.

Impromptu 2.0 costs $595 for the administrator edition, which enables catalog creation and the setting of security parameters. The user edition costs $395. Both versions will be available in August.

SES backs client/server model

SES' new Client/Server Model is a front end for the company's existing SES/workbench modeling tool, which is designed specifically for simulating and evaluating potential client/server configurations.

The software provides a spreadsheet-like user interface that lets net architects explore different client/server designs before implementation. The model can be used to observe the behavior of applications and users, network and computing resource utilization, and other factors by raising a series of what-if questions.

The software runs on Digital Equipment Corp. Reduced Instruction Set Computing/Ultrix systems, Hewlett-Packard Co. HP 9000 Series 700 computers, IBM RISC System/6000 systems and Sun Microsystems, Inc. SPARCstations.

The Client/Server Model will be available this summer for $14,900.

Cognos: (800) 426-4667; SES: (512) 328-5544. ◘

Group helps users see forest

continued from page 27

and business managers who want to minimize risk and maximize return on technology investments.

CFOOT tries to bring these camps closer by encouraging vendors to design and pitch their products in a way that addresses large companies' systems and business needs.

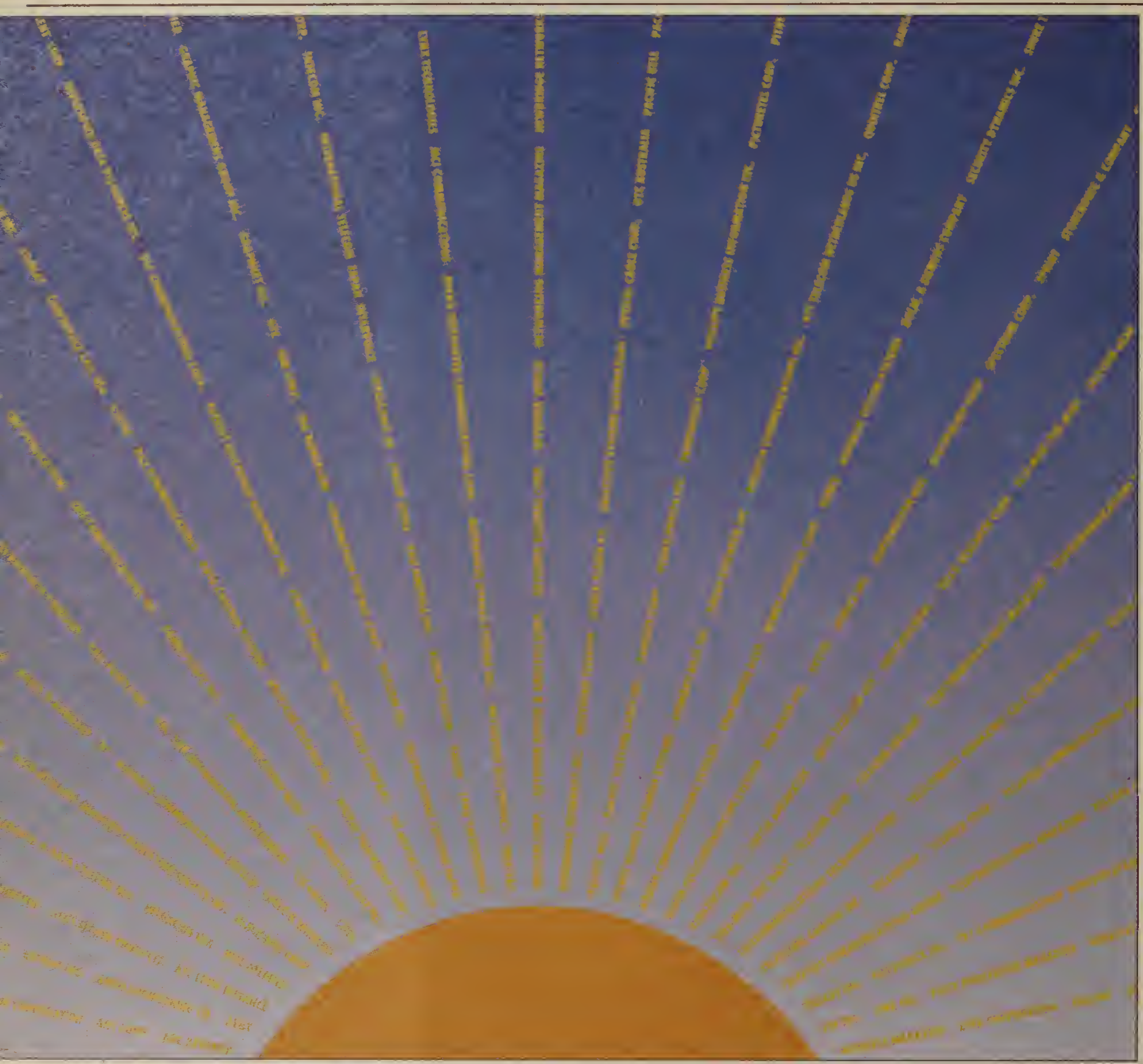
Many promising technologies, such as artificial intelligence, have failed to catch on because vendors typically sell their products to technologists instead of business managers, according to Marcus. Vendors that market dazzling new products but do not offer IS managers a way to manage the products or integrate them with existing ones will not get very far.

"Vendors have to realize that they can't sell a product just because it can put up 27 windows at once," he said. "They have to address what IS managers worry about most — how they are going to support and manage the new technology and integrate it with legacy systems."

Marcus said he fears that object-oriented technology could meet the same fast as AI unless vendors realize what is involved in getting products into companies.

"Although there is a tremendous wave of enthusiasm for object-oriented technology, the technology could be delayed for years unless vendors are precise about what it can and cannot do, and provide tools for users to manage it," he explained.

CFOOT can be reached via electronic mail at rmarcus@atc.boeing.com. ◘



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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

"I would like to see more criminal statutes [against hackers]. But I'd also like to see the people involved in making telecommunications devices more responsible for security."

John Lucich
State investigator
Organized Crime and
Racketeering Bureau
N.J. Division of Criminal Justice

People & Positions

Ronald Bell, vice president and general manager of **Unisys Corp.**'s Unix systems group, has donned the additional title of chief technology officer for the corporation. Bell will oversee all research and development and evaluate technology partnerships.

Marcia Kim, formerly director of applications programs at **Computer Sciences Corp. (CSC)**, has been appointed vice president of applications programs for the systems sciences division. Kim will direct the division's systems integration, geographic information systems and nonfederal activities. She will report to George Meyerson, CSC division president.

Yoji Hamawaki, formerly president and chairman of BMW Japan, has been named president and representative director of **Digital Equipment Corp.**'s Japanese company, Digital Japan.

Hamawaki succeeds **Edmund Reilly**, who has been appointed president and managing director of DEC's Asia region, which includes 13 countries between Korea and the Indian subcontinent.

NSA critiques PEM Internet encryption application

Says PMSP standard more flexible than PEM.

The Message Security Protocol (MSP), the military equivalent of the Internet's Privacy Enhanced Mail (PEM) application standard for encryption, was developed by the National Security Agency (NSA) in the late 1980s under the Secure Data Network System program.

Alliant Techsystems, Inc., AT&T, BBN Communications Corp., Computer Sciences Corp., Digital Equipment Corp., Hughes Communications, Inc., IBM, Motorola, Inc., Paramax Systems Corp. and Secure Computing Corp. participated in the SDNS program, according to the NSA.

MSP, an X.400-compatible application-level protocol for secure electronic mail, will be used for signing and encrypting classified messages in the Department of Defense's planned Defense Message System (DMS) network.

The Preliminary Message Security Protocol (PMSP), to be used for unclassified but sensitive messages, is a version of MSP adapted for use with both X.400 and the the Transmission Control Protocol/Internet Protocol-based Simple Mail Transfer Protocol (SMTP).

Like PEM, MSP and PMSP software applications are flexibly designed to accommodate varying suites of algorithms. PMSP, finalized last December and renamed Mosaic last month, will work with the public-key encryption chipset Capstone. The Internet standard, PEM, uses the RSA public-key algorithms and the Data Encryption Standard, and works with SMTP.

NSA — wearing its usual veil of anonymity — recently answered questions about PEM and PMSP.

Are the NSA's MSP and PMSP related to PEM?

There is no direct relationship between PMSP/MSP and PEM other than they represent similar overall approaches to E-mail security and that the general concepts involved are similar.

The similarity in concepts is not surprising since several of the industry people who participated in the development of MSP later were involved in the definition of PEM.

Is the NSA in favor of seeing either PMSP or MSP incorporated into the PEM standard in the future?

NSA supports the open systems approach based on formal standards for security in E-mail. That is why MSP was developed with the National Institute of Standards and Technology, NSA and vendor participation, and is being supported by NIST for adoption by the International Standards Organization.

"We would advocate the IETF embracing the use of the proposed ISO MSP."

▲▲▲

MSP is a generic protocol that allows the use of any suitable set of cryptographic algorithms for the necessary security functions, including signing, hashing and encryption. Thus, it has applicability to any desired security environment and can provide ready transition from one security level to another.

Another aspect of PMSP and MSP is the ability to address both the SMTP and X.400 environments, and provide seamless, secure messaging between the two. We believe the PEM protocol is considerably less flexible. We would certainly advocate the Internet Engineering Task Force embracing the use of the proposed ISO MSP and the use of federal standards, such as the proposed Digital Signature Standard, for the commercial market they are addressing.

As part of the PEM standard, the Internet Society will be administering a hierarchical system for certifying public keys to assure their authenticity.

Is the U.S. government — either for classified or unclassified purposes — likely to join the registration authority process?

(continued on page 30)

"The NSA believes they are the world's best in encryption. We don't know if they are. They don't know if they are. Let's find out."

▲ ▲ ▲

John Gage
Director of the science office
Sun Microsystems, Inc.

Clipper Chip sets off storm of debate

Critics question wisdom of using secret algorithm for both classified and unclassified encryption.

By Ellen Messmer
and Bruce Schneier
Special to Network World

WASHINGTON, D.C. — The Clinton administration's choice of the secret Clipper Chip encryption algorithm as a future government standard for unclassified but sensitive data has touched off a storm of controversy within industry and academia.

The National Security Agency's (NSA) decision not to publish the private-key Clipper Chip algorithm so it can be subjected to scientific scrutiny breaks with accepted tradition in nonclassified commercial encryption.

The administration also wants the private sector to use Clipper Chip. But many throughout the industry assert that controlling unclassified civilian encryption in the same manner as the military's classified encryption will have a negative impact on business. Mykotronx, Inc. is currently the only NSA-approved supplier of the Clipper Chip chipset.

Without public discussion, the Clinton administration approved the Clipper Chip proposal put forward by the NSA and the National Institute of Standards and Technology (NIST) that will require vendors selling products using the chipset to store an escrow key with the government.

Splitting the key

Although final details about the escrow scheme are still being worked out, it will likely involve splitting the key between two or three government agencies. Law enforcement officials would have access to a users keys only under court order.

At a recent congressional oversight hearing on privacy issues in electronic communications, Sun Microsystems, Inc. criticized the government's decision, which was made without advance industry notification.

"They have proposed a fundamental change in U.S. telecommunications: the use of official U.S. government-endorsed and developed encryption chips for inclusion in private communications equipment," said John Gage, director of the science office at Sun, adding the decision raises many questions.

What will be the effect on U.S. business internationally, asked Gage. "What is the foreign reaction to the U.S. government holding decryption keys? Will we always be able to get these chips? Will foreign manufacturers, some of them our partners, always be able to get them?" asked Gage before the House telecommunications subcommittee.

Taking issue

Les Schoyer, corporate vice president and director of network products at Motorola, Inc.'s paging and wireless data group, also took issue with Clipper Chip. "We have concerns about what appears to not be an open technology," he said.

Gilles Brassard, professor of mathematics at the University of Montreal, who noted that the only way to test encryption algorithms is through peer review,

(continued on page 30)

Clipper Chip sets off storm of debate

continued from page 29

agreed. "It is a giant leap backwards to rely on a cryptosystem whose algorithms are kept secret," he said.

The federal government is breaking new ground trying to keep the Clipper Chip algorithm secret, according to Dennis Branstad, computer scientist fellow at NIST. But he emphasized that software vendors will be able to write applications to Clipper Chip using a standard interface.

Some, however, doubt that Clipper Chip will sell in the private sector. "My customers don't buy my products because they want other people reading their mail," said David Shayer, president of Sentient Software, Inc. and author of the Macintosh DiskLock security program.

The impact on U.S. exports is another issue being raised. "I believe the Clipper will be useless as a means for protecting U.S. business communications with foreign subsidiaries and partners," said Ross Anderson, editor of *Security Reviews,* a publication in Cambridge, England. "There was no coordination with the allies on the Clipper announcement, so there is little good will."

Jim Bidzos, president of RSA Data Security, Inc. pointed out that "banking and finance are global today. Clipper does not comply with any European banking security standards."

RSA encryption algorithms, which are referenced in international standards, are widely licensed throughout the computer and network industry. "Was a study of the potential impact of Clipper on U.S. competitiveness conducted?" Bidzos asked.

Mike Nelson, senior policy advisor in the White House Office of Science and Technology Policy, defended the administration's decision, saying the position on Clipper Chip came from the top after a close review.

"The vice president helped the agencies work together on this to get the entire government behind it," he said. However, Nelson said he did not know why people in the industry were not consulted.

"It is premature for NIST and NSA to be proposing standards before we, as a society, have had time to debate whether U.S. citizens have a right to absolutely private conversations," said Ronald Rivest, a cryptographer at the Massachusetts Institute of Technology and one of RSA's founders.

Others disagreed, saying the escrow-key system is a good idea. Dorothy Denning, professor at Georgetown University, called the Clipper Chip escrow system a good solution to the problem of balancing the need for communications security with the needs of legitimate law enforcement.

Addison Fischer, president of Fischer International Systems, Inc., a Naples, Fla., software firm, said the existence of the split escrow-key system indicates Clipper Chip does not have a secret "back door" since the government would now have a legal means of breaking the algorithm. ◘

The Clipper Chip/Capstone connection

The private-key Clipper Chip chipset contains:

- The "Skipjack" encryption/decryption algorithm with data throughput of 15M to 20M bit/sec

The public-key Capstone chipset contains:

The Clipper Chip algorithm plus

- The Digital Signature Algorithm and the Secure Hash Algorithm, which together constitute the Digital Signature Standard proposed by the NIST in July 1991
- A key-exchange algorithm based on the Diffie-Hellmann technique
- An exponentiation algorithm to provide the public-key function
- A random-number generator

Capstone, which provides public-key cryptography functions, is a superset of Clipper Chip, which has only private-key cryptography functions. Both were developed by the National Security Agency for use in the military's upcoming Delense Message System.

SOURCE: NIST, GAITHERSBURG, MD.

NSA critiques PEM, PMSP encryption

continued from page 29

For the applications under NSA security responsibility, that is, the national security-related community served by the Defense Message System, no.

Key management for DMS, including certificate registration and management, will be integrated into the overall DMS system management and directory service functions.

NSA is supporting NIST in its efforts to develop a hierarchical certificate management process for the Digital Signature Standard, which we plan to integrate with DMS to support secure E-mail exchange across the government. We hope that the IETF would eventually adopt the NIST process for certificate management. ◘

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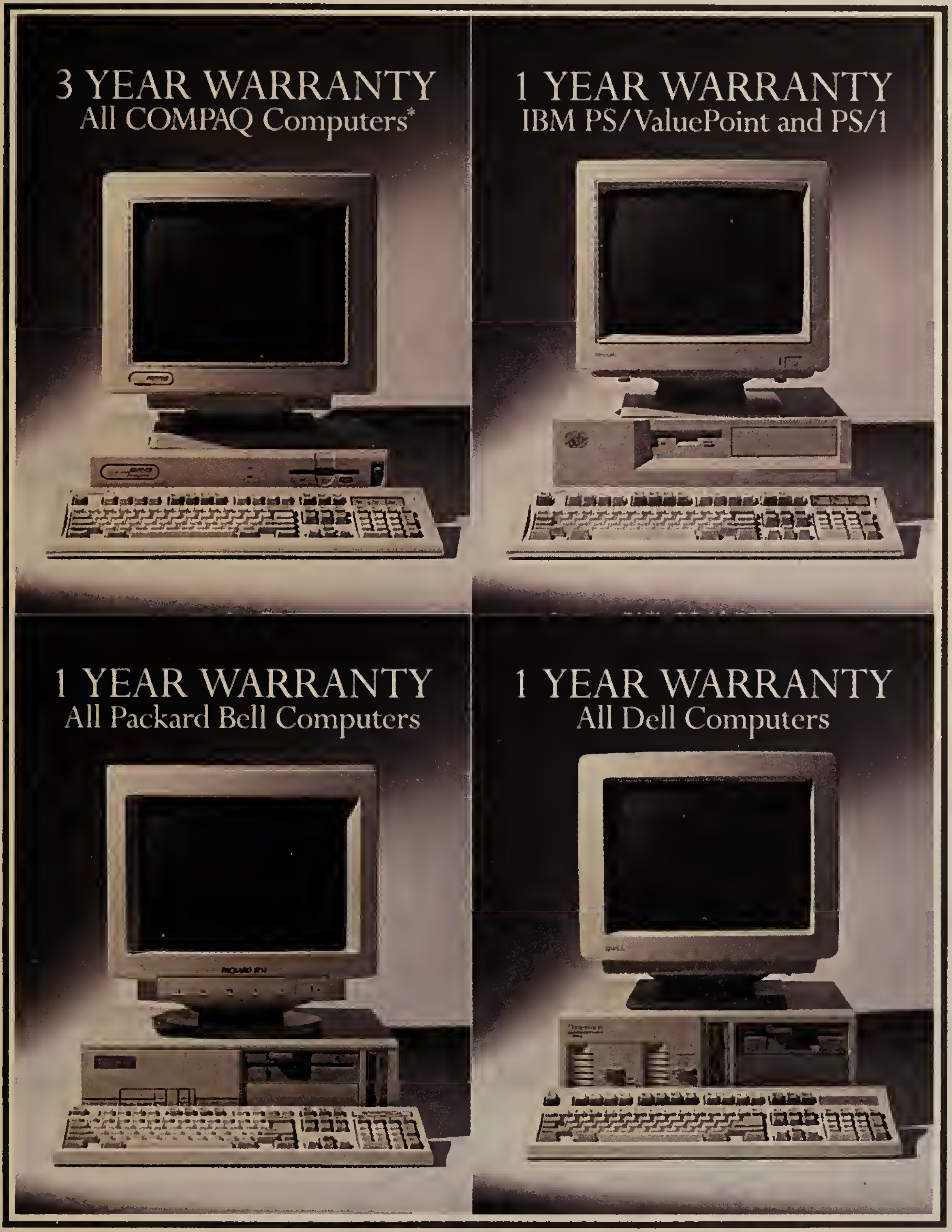

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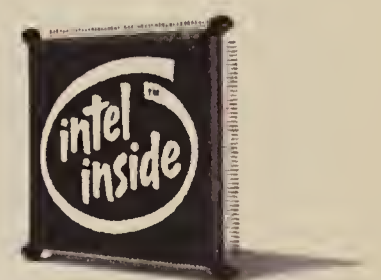

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

Worth Noting

Last year, computer downtime cost major U.S. hospitals 23.4 million worker hours in lost time, the equivalent of $465.6 million in lost wages, according to a survey conducted by FIND/SVP Strategic Research Division for Stratus Computer, Inc.

Manager Minutes

Forrester Research, Inc. has released a report intended to help users deal with the higher support costs caused by the rising number of protocols handled on local-area internetworks.

Dubbed "Protocol Soup," the report recommends that users establish a class system for support based on each protocol's importance to the company.

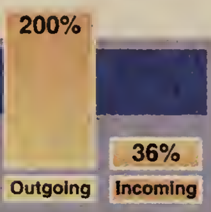
Under such a system, first-class protocols receive full support, and MIS will ensure that net upgrades and redesigns optimize performance and reliability for these protocols. Second-class protocols have to run over the existing infrastructure without enhancements.

Forrester: (617) 497-7090.

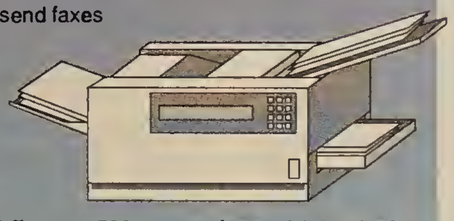
A poll of 22 top health care institutions by **Comdisco Disaster Recovery Services** of Chicago found that nearly 70% of the firms had some sort of disaster recovery plan in place, but it generally supported only large computer operations. Most of the companies have yet to address distributed computing and network issues.

Comdisco Disaster Recovery Services: (708) 698-3000.

Fax facts



- ☐ Outgoing fax volume at Fortune 500 companies has doubled in the past year, while incoming volume has increased by 36%.
- ☐ The average document length has nearly doubled in the past year.
- ☐ The number of corporate fax machines has increased by 25% in 1 year.
- ☐ Most faxing is done between 2 locations of the same company.
- ☐ Only 3% of company facsimile users send faxes at the most cost-effective time.
- ☐ Less than 25% of faxed documents are created on a computer and faxed immediately without hard copy review or signature.
- ☐ Less than 23% of fax users have the capability to fax from their computer.



Findings are based on a survey of 400 Fortune 500 companies and 300 midsize companies from The Dun & Bradstreet Corp.'s listing.

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: THE GALLUP ORGANIZATION, PRINCETON, N.J., PITNEY BOWES, INC.'S FACSIMILE SYSTEMS DIVISION, STRATFORD, CONN.

Project aims to help users solve security problems

Lets users test products in internet environment.

By Alison Conliffe
Associate Features Editor

The security problems inherent in today's enterprise internetworks probably don't give many network managers insomnia, but those who choose to ignore security issues may someday pay the price.

What can a net manager do?

A joint effort of the National Computer Security Association (NCSA) and Datamedia Corp. could help network managers deal with the especially thorny security problems they face.

Dubbed SecureNet, the project is designed to help users evaluate local-area network and workstation security products. In addition, it is expected to spur development of security-related standards by pointing out interoperability problems and stimulating dialogue between vendors.

Users can see SecureNet in action on June 10 and 11 as part of InfoSecurity EXPO '93 at the Sheraton Washington Hotel in Washington, D.C. The project will enable network managers to experiment with information security products, such as virus detection and prevention, LAN backup and access control offerings, running on networked workstations.

"We thought it was time that some responsible organization step forward, take the reins and get vendors and customers together in one place," said Bob Bales, executive director of the NCSA.

The purpose of SecureNet is to give end users a better idea of how each security product fits into the network by mimicking the internetwork environment of today's large companies.

A real-world environment

Unlike the typical canned demonstrations many vendors use at trade shows, the platform for SecureNet will comprise multiple LANs and servers running network operating systems such as Banyan Systems, Inc.'s VINES, Microsoft Corp.'s LAN Manager and Novell, Inc.'s NetWare, as well as hubs, bridges and network applications.

SecureNet will also include several physical security products — access control devices such as locks on diskette drives, security cameras and badge readers. These devices will be incorporated into the LAN, allowing information gathered from them to appear as entries in audit logs.

"SecureNet is a first step toward setting technical standards and interoperability goals for implementing security in a workstation/LAN environment," said Fredric Gluck, director of marketing for information security products at Datamedia.

Gluck lamented that the market currently consists of many small vendors, each of which has implemented its own technology. "Some action toward standards and interoperability is sorely needed," he said.

Vendors of information security products interested in participating in SecureNet should contact the NCSA at (717) 258-1816 or Datamedia at (603) 886-1570.

MANAGING TECHNOLOGY

BY ERIC SCHMALL

Actions speak louder than 'open-door' policies

Staff feedback. You know you can't run an organization effectively without clear, honest and continuously flowing information from people who report to you. Have you ever worked for an organization that proclaimed an official "closed-door" policy? Of course not. Everybody says they want to hear from the rank and file about concerns, ideas and issues that affect the workings of the system.

The trouble is that most managers are simply content with issuing a statement declaring that they're in favor of open and honest communication. However, they take unconscious actions to shut it down.

The manager believes that he's going to hear honest feedback, even though he's stifling it. This disjointedness smothers honesty. The staff will only feed him good news and favorable opinions.

When the inevitable failure strikes, the last thing the manager will realize is that he has not created the "open" environment that he intended to.

Having been both a victim and, at times, a perpetrator of this management breach, I offer three primary techniques that have been known to crush any forthright opinions you solicit from your staff, even while you campaign for open communication. See if you recognize them.

The first focuses on your place in the universe. Always remember that you intrinsically know more than your subordinates.

Oh sure, you can throw them some bone about their being more technically able than you. There's certainly no harm in admitting that they can interpret voice traffic or code better than you.

But deep down you must never lose the conviction that you're superior to them in a number of ways. You're no doubt smarter, better organized, know more about the "big picture" and possess an innate talent to get things done. To maintain this superiority, you have to make sure that any contradictory information you receive is properly handled.

This is best done by filtering statements made by your people. Quite simply, this means registering only the comments that support your opinions and discounting the ones that don't. For instance, if someone complains about the carrier you selected for your voice network, question your subordinate's objectivity. If this doesn't work, you can begin doubting their loyalty.

Secondly, you can greatly mismanage the concept of open feedback by using your staff's comments to punish them. As you discover who disagrees with you more than most, label them as troublemakers. Ensure that when you give their performance reviews you issue low ratings on areas such as "teamwork" and "dedication to task."

Once you've identified such an individual, you can discount any comments or suggestions they may make. After all, what else can you expect from a malcontent?

To drive the final nail into the open feedback coffin, you need only routinely argue away advice you may be handed by your staff. Always make time to listen and nod sagely, and then act as if you never heard a word of it. After all, what do these people really know?

You may even want to invite their suggestions so you can publicly or privately explain why their ideas connot be applied. Once you become partic-

(continued on page 34)

LCI 800 plan gives users discounts

continued from page 23

counts for users that sign up for the service by June. For example, the carrier will offer 50% off combined intrastate and interstate usage in the sixth, 12th, 18th and 24th months of service.

LCI also offers cross-service discounts, which enable users to combine usage from multiple services, including calling card and international offerings.

In some ways, though, 800 Service Select Option is similar to existing toll-free services in that it can be accessed using switched or dedicated links and is billed in six-second increments. LCI offers daytime and evening rate schedules.

Switched access sites pay 20 cents a minute during the day and 18 cents at night, while dedicated access sites pay 14 cents a minute during the day and 12 cents at night. Tariff analysis firms say these rates are typical for a low-end 800 service.

800 Service Select Option is available now.

LCI International: (614) 798-6000. ▣

Rates may deter use of 800 portability

continued from page 24

sessed on all traffic that uses multiple carrier routing features, known as vertical routing capabilities. AT&T said it must charge users to cover local carrier fees for vertical features, but users said the AT&T price is excessive.

One example of a vertical feature is area-of-service routing, which enables users to divide 800 traffic among several long-distance carriers by geographic region. This feature could be used to enable users to do a gradual area-by-area cutover to portability or set up geographical routing after the cutover.

Despite user protests, AT&T is holding firm to its proposed 0.5 cent per call attempt for vertical features. "Our intent is to pass along costs for customers who have chosen to operate in a multicarrier environment," said Shaun Gilmore, marketing vice president for 800 services at AT&T.

Gerry Euston, vice president of business product marketing at Sprint Corp., said the carrier will not charge its customers for use of vertical features that enable users to split traffic with other carriers. Euston accused AT&T of using the vertical features charges to keep users in the fold.

A third major area of concern with 800 portability is the lack of a mechanism in the network to automatically notify a carrier that new traffic will be shifted to it. Bell Communications Research is currently working on software that will provide such an automatic notification, but it will not be available until October. A second software component that allows the receiving carrier to automatically notify the sending carrier that it is ready for the new traffic will not be available until May 1994.

Until the software is available, carriers must rely on manual methods of notification. Although long-distance carriers last week said they were confident that the handoffs would proceed smoothly, users are skeptical.

Visa International's Fong said a lack of electronic verification for handoffs is troubling and added that it is unclear what procedures are in place should something go wrong.

Such administrative and pricing concerns, coupled with existing contract arrangements, may explain why many users are hesitant to immediately leap into 800 portability. As one user, who is a member of the ICA telecommunications policy committee, put it, "I don't think people are going to rush out at 12:01 on May 1 to portability. I think users will tiptoe into the water." ▣

Taff is a legal assistant with the Washington, D.C. law firm of Fish & Richardson and is a free-lance journalist.

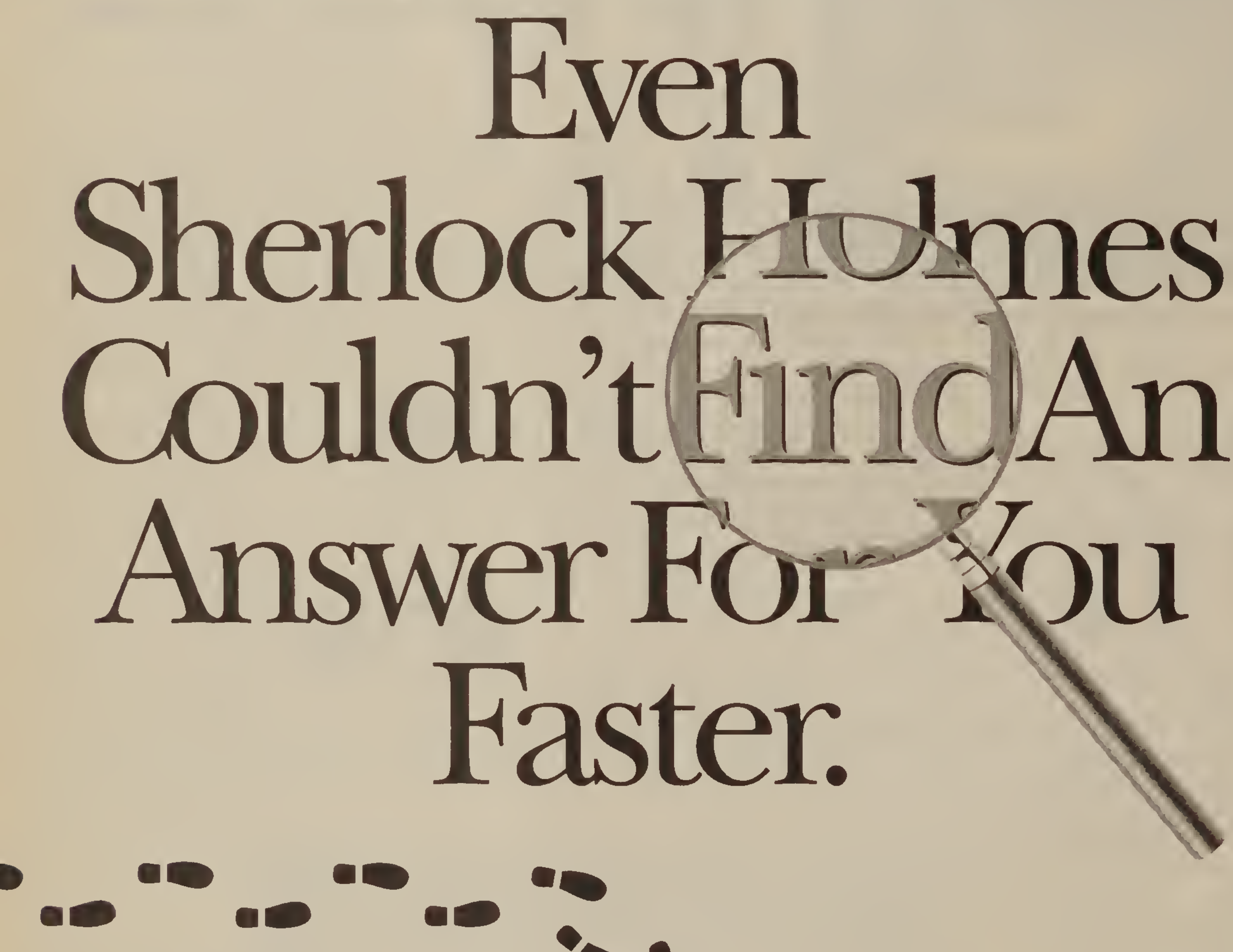
Actions speak louder than policies

continued from page 33

ularly adept at this practice, you can offer even more outrageous advice to them. For example, I once had a manager tell me that my opinion on a certain subject was wrong. Indeed, my facts, my logic or my conclusions may have been wrong, but my opinion was uniquely and unquestionably mine.

When managers routinely brush aside feedback or set up an environment that strains honest communications from their staff, they have not established a feedback loop. They have instead created a fatal information downward spiral that inevitably leads to failure. ▣

Schmall is the telecommunications director of an insurance holding company.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USER FORUM

BY STEVE HODOS

Listening is key to solving users' business problems

Too often networking vendors and consultants become so caught up in technology, they lose sight of its ultimate goal: to fulfill users' needs. It's time they realize that the only way to turn trends into solutions for real-life business problems is to listen to users.

The need for user participation in the systems development process has never been greater. Our industry is littered with the debris of failed projects, and many of these failures may be attributed to the fact that the projects were started for technology's sake alone.

In other words, someone forgot to listen to the user or, worse, having made the effort to speak with the user once, left the interview with the mistaken impression that the requirements were cast in concrete or, at the very least, in paper in the "User Requirements" document.

The user's job changes daily, so why do consultants and vendors think the user's goals for the system won't change?

Part of the reason may have to do with cross-purposes: A consultant or vendor, or even the in-house technician, is "building the system," while the user "wants information faster." When the customer and supplier go off in separate directions, rather than pursue a common goal, mistakes or outright failures are sure to follow.

Many of these failures have to do with the fact that many vendors and consultants believe that users don't really know what they want or need.

For example, in his book *Structured Systems Design*, published in 1977, Ken Orr states, "The user is rarely capable of expressing his desires clearly." But even then, Orr had the sense to follow up his comment with, "The analyst must be capable of helping the user express his needs."

"To help the user express his needs" is a motto by which all vendors and consultants should live. In fact, all technical professionals that deal with nontechnical users should memorize those words, but what is the likelihood of that?

FUSE, Inc., an independent user group for users of Information Builders, Inc. (IBI) products, has long championed the importance of user involvement in product development. At the group's 14th annual conference, FUSE 93 — which will be held the week of May 24 in Atlanta — vendors, consultants and users will meet and share their experiences in solving business problems using technology. The FUSE vendor room will harbor vendors and consultants beyond IBI, while the sessions, which were selected by users and consultants, will be given by consultants, vendors and users.

Conferences such as FUSE 93 provide a forum for users and technologists to share experiences and listen to one another to solve business problems. It is only through this kind of give and take — not just once a year, but daily — that technology can be used to serve users' needs. ◼

Hodos is an application developer at Sea-Land Service, Inc. in Seattle and president of FUSE, Inc., the independent user group for Information Builders, Inc. products. He can be reached via CompuServe at 76444,11.

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EDITORIAL

When is a standard not a standard?

Indulge us a bit of griping about the state of the language. Words are our game and it pains us to see them misused, particularly within our own ranks.

Take, for example, the word "standard" — a word quickly losing its meaning in the network arena. The word ought to be used solely when referring to technical specifications developed by an organization representing the needs of users and chartered to carry out its work in the open.

But "standard" is now applied regularly to specifications developed by vendor consortia, vendor cliques or even a single company.

Consider Microsoft Corp. Its Object Linking and Embedding (OLE) and Open Database Connectivity (ODBC) specifications are referred to as standards.

A specification developed by Microsoft and Intel Corp. for computer-integrated telephony was dubbed a standard by no less than the *Wall Street Journal*.

Big deal, you say. Vendors have certainly been able to develop interoperability specs faster than traditional standards bodies — which, on occasion, created standards that were more of a problem than a solution.

But words have meaning and convey authority. If, for example, we call OLE a standard, we drape Microsoft in the mantle of standards-setter and lend OLE a legitimacy it may or may not deserve.

OLE is no more a standard than IBM's Advanced Peer-to-Peer Networking. It's simply one approach to solving a technical problem and may or may not prove to be in the best interest of users. If lots of vendors back it, it's still not a standard.

In fact, when one vendor develops a standard, its rivals often counter with their own standards, as is the case with both OLE and ODBC.

The danger is that, by bandying about standards, we lose sight of what the word "standard" really means and the value that true standards bring to users.

We also forget the lesson learned from dealing with IBM in the past: Open networks are not built on proprietary standards. ◼

REALITY CHECK

BY TOM NOLLE

Too many choices hamper move to distributed computing

We all know that distributed computing is the wave of the future. Downsizing — the migration of applications from mainframes or minicomputers to smaller systems — is starting to get serious attention even in big IBM shops. But there's a challenge to be faced before we can forklift all that blue-colored iron out of the data center. We have to sift through the plethora of platform choices available to build a distributed data center with the same kind of reliability we have in central data centers today.

Personal computers and local-area networks operate primarily under what is called "I/O redirection" rather than distributed computing or client/server computing. When a client system runs a disk read or write, the command is sent across the network to a server, which returns the results to the client. The client system is responsible for transaction recovery, and even for handling database access "collision" as multiple users try to access the same element of information simultaneously. This is unsuitable for mission-critical applications, because businesses can't rely on each user and each application to handle such problems consistently — or at all.

True client/server computing would establish a more controllable relationship between the owner of an information resource — a file — and its users. IBM's Systems Application Architecture and Digital Equipment Corp.'s Network Application Support and Application Control Architecture are examples of architectures that would provide industrial-strength client/server coordination and support mission-critical applications.

In addition, the Open Software Foundation, Inc. has proposed that its Distributed Computing Environment (DCE) and many smaller firms offer tool kits built around special application program interfaces for distributed computing. These are popularly called middleware products, and they include database architectures, remote procedure calls, communications protocols and even programming languages.

> We have to sift through the plethora of platform choices available to build a distributed data center with the same kind of reliability we have in central data centers.
>
> ▲▲▲

Our wealth of choices is killing us. There are so many different technical strategies that could serve as a foundation for distributed computing that picking just one is too difficult. Instead, we tend to fall back on the generalized I/O redirection services provided by simple PC network operating systems (NOS).

NOSes have become the opium of the people. A NOS does enough to let us run the simple personal productivity applications we have today. This comfortable level of application support makes it hard to interest users in more complex distributed computing strategies that would let them take the next step toward downsizing or client/server computing.

We need to recognize three truths about distributed computing if we intend to make it a substitute for data center computing.

First, we need to accept the fact that treasured PC LAN strategies such as I/O redirection — while suitable for work group computing — won't work at an enterprise level, even if we get the LAN internetworking problems solved. The application architecture represented by NOSes just isn't that scaleable.

Second, we need to agree on a set of application services on which we'd base distributed systems. SQL and relational database architectures will most likely be a part of that service set, but much more will be required — such as mail and document architectures. Reviewing Open Systems Interconnection protocols and DCE services would be a start in this area.

Finally, we need vendors to define the major features for each of these application services — the basic functions that we will expect all implementations to provide.

Distributed computing's success depends on its ability to support the kinds of applications businesses require, and that depends on a carefully crafted and carefully implemented set of network-oriented computing services. Without these services, we'll be running word processors on 200-MIPS PCs in the year 2000, while those central computers just keep truckin' along. ◼

Nolle is president of CIMI Corp., a technology assessment firm located in Voorhees, N.J. He can be reached at (609) 753-0004 or via MCI mail at 349-5845.

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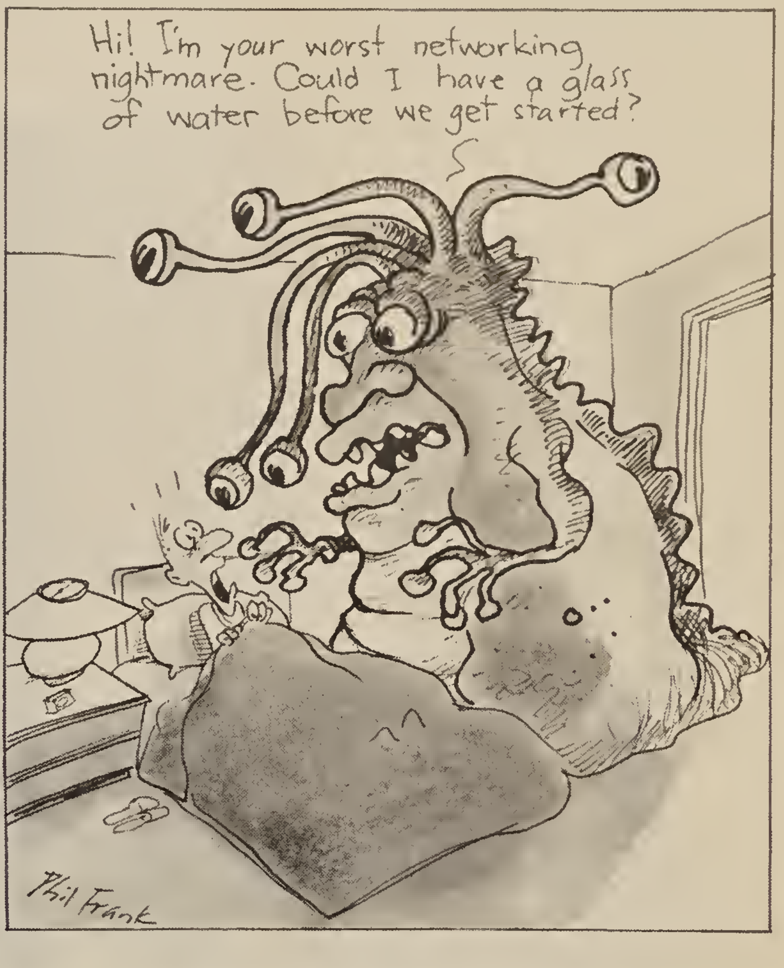
TELETOONS

BY FRANK AND TROISE


Hi! I'm your worst networking nightmare. Could I have a glass of water before we get started?
Phil Frank

LETTERS

Stop spinning yarns

Your article "HP attempts to lower fiber connectivity costs for users" (*NW*, March 22, page 15) perpetuates the myth that long-wavelength (1.3K nm) optoelectronic transceivers for fiber-optic communications are priced much higher than short-wavelength (850 nm) transceivers. This is just not the case.

The article states, "Typical fiber transceivers are priced in the $600-to-$750 range." In fact, the market price for 1.3K-nm-wavelength, 2 km-link-distance fiber-optic transceivers is already in the $140-to-$250 price range and has been for almost two years. The $900 end-to-end cost savings Hewlett-Packard Co. claims for its short-wavelength fiber transceiver is highly overstated.

HP's proposal of a short-wavelength physical-layer implementation for consideration by the ANSI Fiber Distributed Data Interface standards committee is a misspent effort. New, less costly long-wavelength fiber and copper transceivers are now adequately servicing short connection requirements without compromising the forward and backward compatibility designed into the FDDI network. Let's stop spinning yarns and start making high-performance data communications networks easier to implement.

Michael Hartmann
Product-line manager
Data communications products
BT&D Technologies, Ltd.
Kennett Square, Pa.

Prime-time reaction

I'd like to compliment you on your "Letters to the Editor" hot line. It's a great tool for those of us who have little time for using our own word processing software.

Regarding the article "Net industry has mixed emotions on Clinton plan" (*NW*, April 5,

(continued on page 43)

Want to respond to an article or opinion in Network World? *Mail typed letters to Editor,* Network World, *161 Worcester Road, Framingham, Mass. 01701, or fax them to (508) 820-3467. Transmit your response via MCI Mail at 390-4868 or to our Bulletin Board System. (See page 5 for BBS instructions.) Letters may be edited for space and clarity.*

Backing up the

Network managers face a plethora of issues in centralizing the chore of LAN backup.

Traditionally, LAN backup has been a departmental affair, but growing numbers of net managers are now taking an enterprisewide approach and centralizing backup operations.

Today's enterprise backup solutions are rapidly coming to mirror those of the mainframe world, with an emphasis on centralization, performance, automation, resource management and reliability.

Local-area network backup solutions are also becoming more hardware-independent as software is coming to be the dominant consideration in building a backup system.

In addition, proposed standards, such as Novell, Inc.'s Storage Management Services (SMS), promise to let managers switch tapes between different manufacturers' drives, while "migration-aware" file directories allow users to see and access files stored off-line as if they are on a local disk.

Backup tasks are also becoming integrated with other LAN management functions, such as network management and security, through servers that handle all of these functions concurrently.

The main reason for the growing complexity of backup systems is simple: The amount of data stored on LANs is growing by 60% a year, according to market research firm Peripheral Strategies, Inc., and managing gigabytes of backup data and hundreds of thousands of files isn't possible without powerful new tools.

But as the complexity of the backup process grows, so does the planning process facing network managers.

Glass house effect

"We are using a glass house [backup] approach with central control," says Sue Stanley, technical services manager for Boulder County, Colo.

"We handle backup like on a mainframe, with incremental backups four times a day, one full weekly backup and off-site storage," Stanley explains. "But we decided not to back up onto the mainframe. We are looking for enterprise solutions that don't tie us to the mainframe forever."

Stanley is backing up seven file servers with a total of 14G bytes of disk space using two 4G-byte digital audio tape units from Maynard Electronics, Inc. with plans to add a third. "The media is not as fast as on the mainframe, so we have to get used to lower performance media, but the reliability is there," she says. "So far, I am happy with the reliability of the drives and the media."

Net managers haven't always been so keen on LAN backup across the enterprise.

A key design issue for network managers in the past was whether to go with server- or workstation-based backup. Each has advantages and disadvantages.

Attaching tape drives directly to the server generally offers faster performance because server data doesn't need to cross the LAN to get to the tape drive, and it facilitates dealing with multiple file formats. It also reduces network traffic. Workstation-based systems let users consolidate the process in one place, but they tend to run more slowly and may have difficulties handling the file formats of other workstations.

Some users are beginning to use dedicated servers to combine the best aspects of both server- and workstation-based backup. Dedicated backup servers centralize the backup process and can cope with multiple file formats. In addition, problems on dedicated backup servers don't affect the rest of the network, and they take a load off other file servers.

"Before, every server on the network had its own backup system, but we decided to go with centralized backup after we added the third server," says Gary Tarr, chief of the Information Systems Development Branch at the Foreign Agricultural Service (FAS) of the Department of Agriculture in Washing-

enterprise

ton, D.C. "After we added the third server," he says, "it got to be too much trouble to run around and collect tapes."

Tarr now has a single dedicated backup server that uses software called PowerSave from Performance Technology, Inc. and an 8mm tape cartridge system from Exabyte Corp.

PowerSave works with Banyan Systems, Inc.'s VINES and handles backup for the entire FAS network, which includes 550 personal computers and 16 servers on 17 Ethernet segments with a total of about 50G bytes of disk storage.

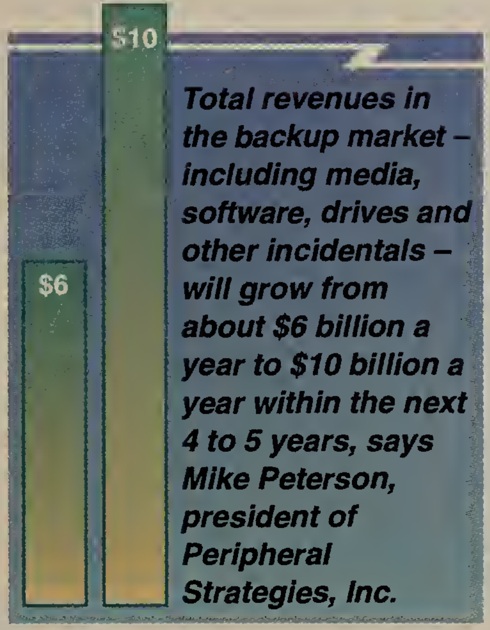
The FAS' backup server, which is located in the agency's main offices with the rest of the network, also handles backup for two remote sites — one connected via a T-1 line and the other via a 56K bit/sec leased line.

The larger remote site, also in Washington, is connected via the T-1 line and has about 30 clients and 600M bytes of storage. The smaller site, in Ft. Collins, Colo., has about four clients.

"We have spare capacity on the WAN late at night, so it's not a problem," Tarr says. "But it would not be practical to back up during the day because the backup process saturates the backbone."

The fundamentals

Getting gigabytes of data off networked disks and onto the tape is an involved process, and backup systems that are too slow may still be running — and clogging up the net — when people arrive for work in the morning.



Total revenues in the backup market – including media, software, drives and other incidentals – will grow from about $6 billion a year to $10 billion a year within the next 4 to 5 years, says Mike Peterson, president of Peripheral Strategies, Inc.

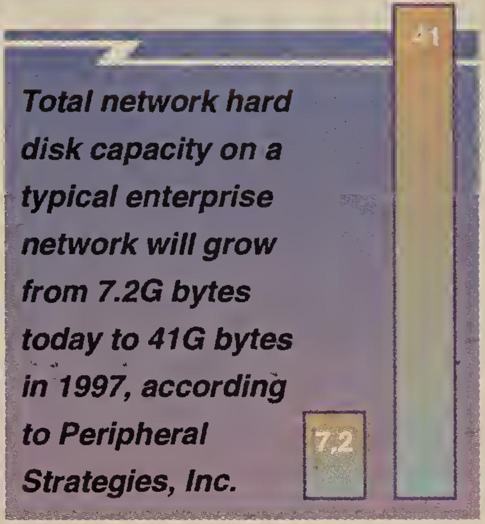
"You need to see if you can back up everything within the available time, and you may need to have more than one system," explains Patrick Corrigan of the Corrigan Group, a Sausalito, Calif.-based network consulting firm. Backup vendors have a number of strategies for improving performance.

One technique is called interleaving, which improves performance by allowing a single tape drive to accept backup data from multiple sources simultaneously. Since most tape subsystems accept data at speeds of 10M to 30M bytes per minute — faster than most clients can feed data — they don't operate at full speed all the time, but rather intermittently.

A few companies, such as GigaTrend, Inc., Epoch Systems, Inc. and Legato Systems, Inc., use interleaving to keep tape drives spinning at full speed. Using interleaving, GigaTrend, for example, claims backup speeds of up to 50M bytes per minute.

Another approach to improving performance and system capacity is to run backup sessions in parallel.

With this technique, the net manager hangs multiple tape drives off a single server and backs up various files to different drives on the server, essentially running more than one backup at the same time. This approach, sometimes called concurrent drive support, removes the bottleneck inherent in using a single tape drive and has been adopted by Intel Corp. in its StorageExpress system and by GigaTrend, Epoch and others.



Total network hard disk capacity on a typical enterprise network will grow from 7.2G bytes today to 41G bytes in 1997, according to Peripheral Strategies, Inc.

Enterprise systems are extending their capacity through the use of bigger tape drives and automatic tape changers or robots that automatically load new tapes into the drive as they are needed.

While tape robots do not actually increase the amount of data that can be stored on a single tape, they effectively increase capacity by allowing a single drive to use multiple tapes to back up more data without human intervention.

While it's theoretically possible to back up gigabytes of data onto 120M-byte tapes, the capacity of single tapes is important because backup happens at night when manual tape swapping isn't usually an option.

"Always buy larger backup systems in terms of capacity than you need," Corrigan advises.

Enterprise backup systems are also taking new steps toward reliability. For example, intelligent error handling during the backup process differentiates between critical and noncritical errors and lets systems proceed even if there is a problem with a particular disk or file, rather than shutting down the whole system over a trivial problem.

"The hardware is now fairly reliable, but most software still leaves something to be desired, and [software] problems are more subtle," Corrigan explains.

"For example, on one system if you manually mounted a NetWare volume, the backup software couldn't see it," he says. "Another had a problem if you flagged a directory to be backed up and later added more files to the directory; it could only see the files that were there when you originally flagged the directory."

On the hardware side, reliability is steadily improving. "Are there problems?" Corrigan asks. "Sure. But current hardware in terms of ability to back up and restore data is far more reliable than the technology of three and four years ago."

By JEFF UBOIS

Software catches up

While the contest between media and tape formats continues, the most important differences between backup systems are now in the software.

"Software selection is more important than hardware selection," Corrigan explains.

The major trend today is to create independence between backup hardware and software, he says. Since software vendors are increasingly providing multivendor support, users can choose a software package first and then select from a variety of hardware systems.

One of the most important trends for LAN managers is the evolution of network operating systems to better support backup functions. A case in point is Novell's SMS, which provides a standard interface between backup software and NetWare for use by third-party backup vendors.

"SMS is a focal point for hardware independence, and it is at least starting to bring some standardization in terms of common data formats and access methods so that a tape made on one drive can be played on another," Corrigan explains. "Now it's like the old days of CP/M, when every computer had a different disk format. But with SMS, there is no reason why tape can't be used as a medium of data exchange."

Handling different file formats from a single workstation or server is vital for enterprise backup solutions, and SMS will address this too.

"SMS is going to be a factor in cross-platform [backup]," Corrigan says. "It will have the ability to back up DOS, Windows, OS/2 and Unix files and who knows what else."

SMS is also important because it provides a standard application program interface for backup software vendors that enables them to immediately ship revisions and updates to accompany new releases of NetWare.

In the past, it often took vendors three to six months to adjust to new NetWare releases, and during that time, users had the choice of postponing the upgrade or forgoing reliable backups.

Putting it all together

Enterprise backup of LANs is often integrated tightly with other LAN management tasks such as disaster planning, security and storage management.

"The next step you will see is people looking at data management, rather than just backup and archiving," Corrigan explains. "You are going to see a coming together of file management, data manage-

(continued on page 43)

NETWORK WORLD TEST ALLIANCE

Test underscores differences in modem throughput

By DANIEL BRIERE

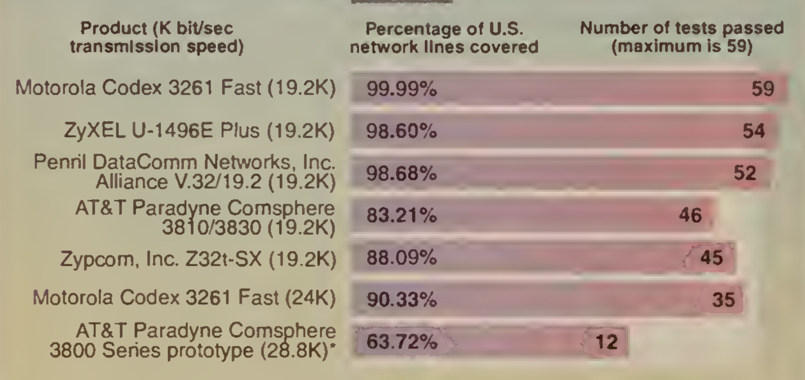
Most modem users wish for the same thing — faster modems. New technical breakthroughs have pushed the theoretically attainable throughput of modems over public network lines to 115.2K bit/sec.

In practice, though, theoretical throughput levels are rarely attainable. The question then is just how fast will today's high-end high-speed modems go?

In a recent head-to-head modem evaluation conducted by *Network World* Test Alliance member TeleChoice, Inc., some modems' asynchronous file transfers leapt past 80K bit/sec in throughput, making point-to-point transfer of massive amounts of data possible, even over the public analog network.

Motorola Codex walks away with sync test

Figure 1



Scores of 100 block errors or more, 10,000 bit errors or more, or automatic fallback to lower speeds constituted a failed test.

*The Comsphere 3800 Series prototype was subjected to only 21 of the 59 tests representing 91.83% of all lines.

GRAPHIC BY ANNE GIANCOLA

SOURCE. TELECHOICE, INC., VERONA, N.J

The majority of tests, however, indicate that throughput consistently fell well below 80K bit/sec.

TeleChoice conducted a battery of synchronous and asynchronous tests on some of the fastest modems on the market and found considerable differences in the performance of all the modems across the range of test conditions.

While Motorola Codex's 3261 Fast modem came out on top for synchronous applications, the choice for asynchronous applications was less clear. Although Zypcom, Inc.'s Z32t-SX won the race for maximum throughout across clear lines, ZyXEL's U-1496E Plus fared the best across the broad spectrum of lines.

Of most significance in this trial is the validation that modems running as high as 28.8K bit/sec can indeed reliably and consistently communicate over the public network.

Emulating the public net

In this evaluation, TeleChoice examined the performance of six modems that operate at speeds higher than the V.32bis 14.4K bit/sec speeds: AT&T Paradyne's Comsphere 3810/3830, a prototype of AT&T Paradyne's 28.8K bit/sec Comsphere 3800 Series modem, Motorola Codex's 3261 Fast, Penril DataComm Networks, Inc.'s Alliance V.32/19.2, Zypcom's Z32t-SX and ZyXEL's U-1496E Plus modem.

Each modem was subjected to three examinations: a synchronous bit error rate test (BERT); an asynchronous throughput test transferring the same file pattern over various network line environments; and an asynchronous throughput test of five common file formats over a relatively clear transmission line. Where pertinent, testing was performed in duplex mode.

Two other modems capable of transmission above 14.4K bit/sec — Telebit Corp.'s World Blazer and U.S. Robotics, Inc.'s Courier HST Dual Standard — were not tested because they were not capable of communications in a duplex mode above 14.4K bit/sec.

The modems were operated at their peak line and data terminal equipment (DTE) rates for all tests in order to truly assess the edge of the envelope in data transmission today.

In order to assure consistency across the testing procedures, TeleChoice simulated the performance of the public network with specialized equipment from Telecom Analysis Systems, Inc. (TAS) of Eatontown, N.J. (see story, page 42).

The TAS equipment was outfitted with a series of network-emulation parameters as defined by the Electronic Industries Association/Telecommunications Industry Association (EIA/TIA) TR-30.3 Subcommittee on Telecommunication Network Interfaces. The TR-30.3 Subcommittee is populated mostly by representatives of modem manufacturers interested in standardizing the process of evaluating modem performance.

The TR-30.3 Subcommittee defined seven local loops and 12 end office-to-end office conditions. Various combinations of these loops and central office conditions were paired to yield 59 possible network connections that emulate line conditions on the public network.

The subcommittee has prepared two draft standards — PN 3064, which contains the 59 line parameters, and PN 2826, which outlines a recommended procedure for testing modems over these 59 lines.

These two PN specifications are expected to be presented for formal approval by the subcommittee as TSB-37A and TSB-38, respectively, by the end of this year. They will then be passed to ANSI for consideration as a standard. TeleChoice used these two draft documents as the foundation for its testing procedures.

PHOTO ©1993 DANIELLE SWICK

Daniel Briere, president of TeleChoice, and Kevin Langan, product support engineer of TAS, examine test equipment.

Getting in sync

End users with synchronous applications will find large disparities in the performance of different modems at higher speeds.

We tested all six modems, with the Codex 3261 configured in both the 19.2K and 24K bit/sec line rate modes. We used a BERT that sent 10,000 blocks, each 1K bit in size, over each of the 59 lines. Our goal was to assess bit error rates at the maximum line rates offered by each of the modems.

The BERTs were designed to determine the ability of the modems to effectively convert digital information at the modem/data terminal interface to analog information at the modem/telephone interface and vice versa. Modems that do a good job of this conversion generate fewer errors.

Motorola Codex 3261 wins synchronous tests hands down; asynchronous race looks much tighter.

Each of the vendors claim a particular maximum line rate possible with each modem, and the line speed of each modem was not allowed to fall back from this maximum.

We disabled the modems' terminal flow control and used a 2047 file pattern for the transfer itself. The 2047 pattern is a pseudo-random data pattern defined by the CCITT for modem testing. We also turned off the data compression and error correction functions, which allowed us to observe the true performance of the modems for synchronous data.

Motorola Codex's 3261 Fast cruised through the BERT trial. At 19.2K bit/sec, the 3261 Fast had a spotless record, passing synchronous data across all 59 lines without failing a test (see Figure 1, this page). What's more, only two lines experienced more than 10 block errors in a 10,000-block session. Only six lines had any errors at all.

Even at the 3261's 24K bit/sec line speed, the modem still sped through 35 tests, demonstrating it could run without a hitch over 90.33% of the nation's public network lines.

ZyXEL's U-1496E Plus and Penril DataComm's Alliance modems also passed the vast majority of the tests and proved they can handle most line conditions in the U.S.

Most of the modems tested had considerable problems handling the set of lines known as

(continued on page 42)

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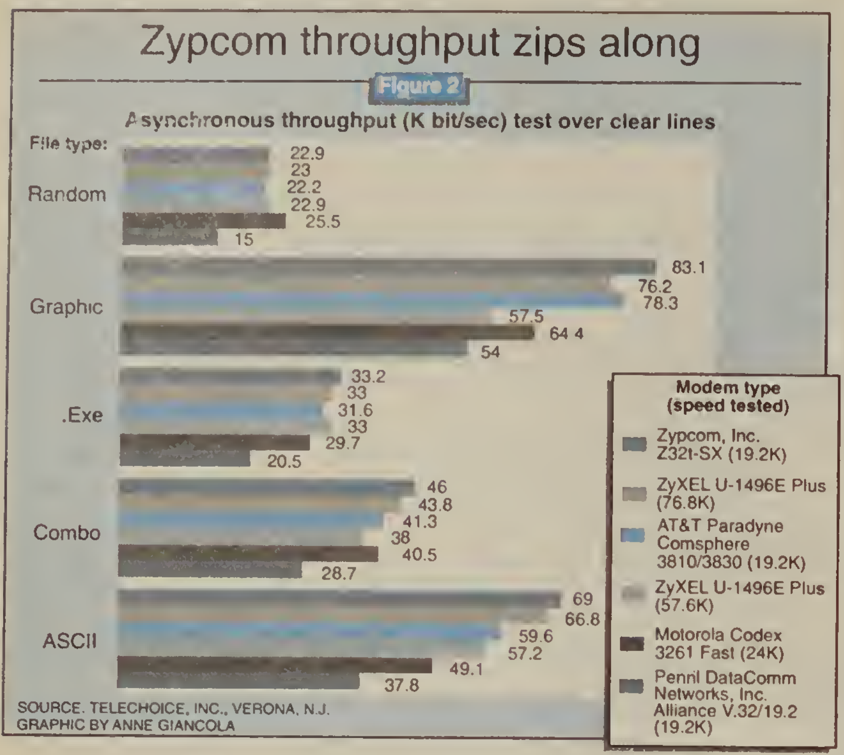

SOURCE. TELECHOICE, INC., VERONA, N.J.
GRAPHIC BY ANNE GIANCOLA

(continued from page 40)

17a, which features second- and third-order intermodulation distortion, digital pulse code modulation (PCM), robbed bit signaling and a high amount of near-end echo. AT&T Paradyne's Comsphere 3810/3830 fared best on the 17a lines.

The Comsphere 3810/3830 and Zypcom's Z32t-SX performed rather poorly on some BERTs. Both modems had major problems operating on Line 19, Loops 1 to 7.

The TIA TR-30.3 specification calls for a 700 msec round-trip delay — mimicking satellite propagation delays — to be inserted in all loop combinations of Line 19. Zypcom's units were designed to handle a maximum round-trip delay of 600 msec, and AT&T Paradyne's Comsphere 3810/3830 handles a delay of 640 msec.

When the delay exceeds 600 msec, Zypcom's Z32t-SX drops the connection, while the Comsphere 3810/3830 in the same situation automatically drops to 14.4K bit/sec to maintain the link, which caused it to fail our test based on the criteria we set. Zypcom says it is adjusting its modems to cover a full range of satellite delays.

We also tested a prototype version of AT&T Paradyne's upcoming V.fast modem, which operates at 28.8K bit/sec.

At the time, AT&T Paradyne had not finished the prototype, but we were able to test 21 of the 59 EIA/TIA lines, representing 91.83% of all public net lines. On those, the V.fast modem passed 12 line tests, representing 63.72% of the nation's network lines, an admirable amount given the fact that the modem was operating at 28.8K bit/sec.

Async across the net

For asynchronous applications, the landscape was somewhat different.

We tested throughput of 10,000 blocks containing 100 characters each. To avoid obscuring the results in any way, we turned off data compression capabilities and again used the 2047 file pattern. Terminal flow was set to Request To Send/Clear To Send (RTS/CTS).

The results shed some light on how fast these modems can transmit asynchronous data across a wide variety of line conditions. But there was no clear-cut winner, and depending on users' particular data transfer requirements, a number of modems could be considered satisfactory.

Motorola Codex's 3261 Fast achieved the highest throughput for most lines, averaging around 26K bit/sec.

However, the 3261 clearly could not handle the conditions found in Local Loop 1, which features less attenuation than other loops. There is less loss with Loop 1. The network intermodulation distortion is more difficult to overcome because of the high level of the signal. Loop 1 is found in approximately 34% of the nation's local loops.

Loop 6 also haunted some modems, mostly due to the fact that it defines a condition that is equivalent to Loop 1 on half of the circuit.

On the whole, end users who communicate over a broad range of line conditions might be better off with either the Comsphere 3810/3830 or the ZyXEL U-1496E Plus. Both offered extremely reliable transmission across all 59 lines, completing the transmission in every case at a rather consistent speed.

The ZyXEL modem is faster than AT&T Paradyne's practically across the board, and it handled the tough Line 19a combinations at a fairly brisk pace — 22K bit/sec on average, compared to AT&T Paradyne's 16.6K bit/sec. However, the ZyXEL modem was unable to deal with the range of network conditions at its advertised 76.8K bit/sec speed. We had to drop the maximum DTE speed to 57.6K bit/sec.

The Penril DataComm and Zypcom modems both performed adequately and, in some cases, superior to the other modems tested. However, both had problems in some of the 17a and 19a line combinations.

Sending it to the max

The third test probed the modems' peak performance. All modems were configured to perform at their absolute optimal rate. The DTE rate was set to the maximum allowed with each modem. Data compression and error correction were turned on, while the line rate was set to auto and terminal flow control was RTS/CTS.

Five asynchronous files were sent over a clear line (Line 17c1): ASCII, a standard text file; Graphic, a metafile; EXE, an IBM-compatible executable file; Random, an uncompressible file full of random characters; and Combo, a mixed file containing one-third text, one-third Random and one third ASCII.

Zypcom's Z32t-SX ran away with the laurels in this trial, receiving the highest throughput scores currently possible in four of our five tests. The only test it lost was with the Random file, which Motorola Codex's 3261 won because of its faster line rate.

Here, the ZyXEL modem did perform as advertised at its 76.8K bit/sec speed; it just needed a clear line to do so. ZyXEL was a contender in nearly every throughput race, finishing second in four out of five tests. AT&T Paradyne's Comsphere 3810/3830 and Codex's 3261 ran behind the pack in most of these tests (see Figure 2, this page).

With regard to the maximum throughput test, Motorola Codex responded to its lackluster showing by saying its modem is optimized for thoughput in half-duplex mode, and not full duplex, on which the test focused. Motorola Codex says the majority of users employ half-duplex mode.

The most disappointing showing came from Penril DataComm's Alliance V.32/19.2 modem. It consistently operated at speeds 40% lower than those of other modems, despite the fact that all settings and parameters were confirmed with the company. According to Penril DataComm, the product currently contains a bug in its compression software.

Random bits

In testing the modems, we noted a number of items that affected our progress along the way. The Codex 3261 modem is unable to autobaud to 115.2K bit/sec, despite the fact that the modem is rated at 115.2 as a standard feature. Users must manually set the modem to this speed.

All of the other modems were able to configure to their appropriate speeds via software commands in the setup strings.

The ability to download new software via modem proved to be a saving grace for AT&T Paradyne.

Front-panel displays were obviously critical to our tests, and there is a remarkably different look and feel to each one. The display on the ZyXEL modem seemed the most user-friendly. The Motorola Codex modem caused us the most grief in setup and use.

Documentation was also a critical component of the testing. Motorola Codex had the most helpful and extensive documentation.

The bottom line

In the April 19 issue of *Network World,* the Buyer's Guide on high-speed modems named three modems — the AT&T Paradyne Comsphere 3810/3830, Motorola Codex 3261 and Zypcom Z32t-SX — as the cream of the crop. To a large extent, these modems earned their stripes in our laboratory battle.

For synchronous applications, you can't go wrong with the Motorola Codex 3261 Fast modem, priced at $1,695. This modem passed all 59 line tests in spectacular fashion at 19.2K bit/sec and 35 tests accounting for 90.33% of the nation's public network lines at 24K bit/sec.

(continued on page 43)

Net simulator eases tests

Testing of the seven high-speed modems was conducted using advanced telephone network emulation equipment loaned to TeleChoice, Inc. by Telecom Analysis Systems, Inc. (TAS) of Eatontown, N.J.

TAS provides the most widely used equipment for advanced modem testing applications. The company manufactures Windows- and DOS-based testing platforms designed to take modems through a rigorous battery of throughput and bit error rate tests to project modem performance over the public network.

TeleChoice connected each pair of high-speed modems to a TAS Model 240 Voice Band Subscriber Loop Emulator, which implements test conditions for V.32, V.32bis and V.fast modems as outlined by the Electronic Industries Association/Telecommunications Industry Association (EIA/TIA) TR30.3 Committee.

In the modem tests, the Model 240 simulated the range of subscriber loop conditions that exist nationwide. The EIA/TIA has standardized seven local-loop parameter configurations for modem testing.

The Model 240 was connected to a TAS Series II Telephone Network Emulator, which emulates the end office-to-end office portion of the network connection.

The Series II includes emulation of analog transmission facilities, digital transmission facilities and each central office type.

Analog conditions can contain a range of impairments, including attenuation, white noise, gain distortion, phase jitter and gain hits.

Combined, the Series II and Model 240 made it possible to test the full suite of proposed EIA PN3064 test conditions — which amounts to 59 generic types of lines.

A TAS Gemini 1022HS dual data analyzer attached on the customer premises equipment side of the modems handled file-transfer and data compression tests.

The Gemini system was the core of the testing platform as it generated the synchronous bit error rate and asynchronous throughput tests, recording bit and block errors, minimum, maximum and average throughput, and transfer failures.

The CCITT Study Group 17 and EIA TR30.3-recommended files, many as much as several megabytes in size, can be transferred automatically using the Gemini system.

The TAS Gemini system was controlled via Windows-based automated testing software, TASKIT for Windows. This software provides complete control of all central office conditions, impairment settings and terminal parameters.

In the end, the TAS setup proved ideal for modem testing. The CCITT, ETSI and EIA/TIA specifications for line and central office conditions come preloaded with the system and make modem testing about as automated as it can get.

Given that it took nearly two days of testing per modem, automation is certainly preferred.

For further information, contact TAS at 34 Industrial Way East, Eatontown, N.J. 07724, or call (908) 544-8700.

— Daniel Briere

Backing up the enterprise

continued from page 39

ment and document functions, and backup and archiving — it's getting to the point where people are not going to look at them as separate functions."

For example, the network group for Fluor Daniel Corp. in Irvine, Calif., is using eight workstations to handle backup, network management, virus scanning and security reports for 40 servers with about 60G bytes of disk storage. These eight workstations are centralized in one room and are all running backup software called Xpress Librarian 2.0 from Emerald Systems, Inc. of San Diego to back up a 2,000-node, 10Base-T Ethernet network of PCs.

The many prices of network storage

Device	Throughput (Byte/min)	Capacity (Bytes)	Cost/drive	Cost/megabyte
Magneto-optical	5M to 30M	128M to 650M	$3,500 to $8,000	30 cents to $3
1/4-in. cartridge	6M to 20M	150M to 1.35G	$800 to $4,000	4 to 24 cents
Digital audio tape	11M	1.3G to 2.0G	$2,000 to $6,000	2 to 4 cents
8mm	14M to 20M	2.3G to 5.0G	$5,000 to $8,000	2 to 8 cents

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: PERIPHERAL STRATEGIES, INC., SANTA BARBARA, CALIF.

At Fluor Daniel, backup is just one of a number of functions related to managing the network. "We produce disk management reports, and we monitor what people are using," says network analyst Steve Hurley. While there are no set limits on how much disk space users are allocated, the reports allow the network group to contact those who appear to be consuming too much disk space.

The backup workstations are also running Central Point Software, Inc.'s Anti-Virus and Frye Computer Systems, Inc.'s Frye Utilities for Networks, which provides reports on file server configurations and net performance.

The network group is also concerned with disk grooming and file migration, the latter of which is the process of moving unused files off primary disk storage and onto secondary media, such as optical disk or tape.

"Novell 4.0's new archiving features are going to help us with near-line storage," Hurley says, adding, "We are looking at disk grooming, and there is an archive feature from Emerald that we are also looking into."

Other users are also seeking ways to migrate files efficiently and take advantage of hierarchical storage management, which lets network managers make more effective use of expensive hard disk space by shifting files that are infrequently accessed to less expensive optical disk and tape storage.

Steve Couturie, a Unix specialist with Chevron Information Technology Co. in La Habra, Calif., is using servers from Epoch to handle backup and file migration for a 140-node Ethernet and Fiber Distributed Data Interface network of Unix workstations with more than 150G bytes of disk storage. Couturie is also using optical disks on the Epoch servers to handle near-line storage and file migration as well as a tape robot from Exabyte to handle backups from the Epoch servers.

"Files migrated to the Epoch server still appear to end users to be on the client," Couturie explains. "But they get backed up directly from the Epoch server."

For managers contemplating adopting hierarchical storage management, Couturie offers some advice. "Make sure whomever you are dealing with has experience and is in it for the long haul," he says. "And try to make sure that backup, migration and user access patterns all mesh."

In other words, migration needs to be done with an awareness of user needs for data access. For example, imagine the restore requests a network manager would receive the day before quarterly reports are due if an automatic migration process simply moved the data necessary for those reports off the main disks because it had been untouched for four weeks.

Boulder County's Stanley is also looking for file migration but with special features to help meet legal obligations imposed by the state government.

"We are a local government and have to file some data according to state archivist rules, so I need the ability to select the type of media based on class and to direct where it is archived," Stanley explains. "I visualize that all directories — from those on the file server to optical storage to tape — would all be in one database. I don't want to have to search multiple databases to find my media."

"I can't wait for hierarchical storage," Stanley continues. "I would love it if as documents age, they would migrate off expensive disks but remain [on the local directory] so users could access them."

One key to the file migration issue is NetWare 4.0's ability to display on local directories the files that are, in fact, stored elsewhere or off-line.

Stanley says that for her, "NetWare 4.0 is the tip of the iceberg. We will use it, but I need more; I need hierarchical storage that will maximize my disk investment by automatically migrating files as they age, yet still allow user files to be accessible online."

Ultimately, Stanley says, she'd like to see capabilities similar to those of IBM's MVS mainframe operating system, which automatically migrates files as they age. She would also like to see migration according to user-defined rules and classes.

"For performance and ease of use, I'd like to see my LAN backup and restoral be similar to the mainframe," she says.

Strategy and tactics

The strategic goals of managers implementing enterprise backup systems are essentially the same, but tactical approaches vary widely from site to site. In particular, managers should consider whether they plan to back up clients in addition to servers, as well as decide if they want mainframe backup, security features and wide-area network backup.

Managers are divided about backing up clients on the network. "I back up everything I can," Couturie says, "because I know what happens if I don't: People lose their data and wonder why there were no backups."

But others say end users who are too foolish to back up their data to the LAN are on their own. "No way on local storage," Hurley says. "Who wants to manage that? Basically, we have taken the position, 'If you want to protect your data, put it on the LAN.' "

Net managers may also want to consider backing all the corporate LANs up to the mainframe.

On the plus side, data centers are already well connected with high-speed data lines. They have highly automated backup, tape libraries and security, and offer a way for managers to save the time needed to run their own backup systems. They are also almost infinitely scalable.

On the other hand, the cost of mainframe disk storage is high, and if the point of client/server is to reduce or eliminate data center costs, this may only be a practical option for the largest companies.

As backup becomes an enterprise issue, disaster recovery and security become more relevant. Off-site tape rotation is already de rigueur, and tape backup systems such as Intel's that are designed for easy tape-to-tape copying or duplexing will reduce off-site storage problems.

Key to any disaster recovery plan is practice. "Test your system periodically and have disaster recovery drills," Hurley says. "It's also very important to make sure all your recovery procedures are written and up to date."

Security options on backup systems are rather limited, however. Many systems now provide encryption capabilities, but these present inherent risks to reliable, easy, fast restoral. Lost bits in an encrypted file can render it useless, as can forgotten passwords. Currently, physical security remains the primary way users safeguard their data.

Companies with remote sites that want to centralize backup operations may have difficulty deciding whether to perform that backup over WAN links.

For some users, such as the FAS' Tarr, spare capacity at night makes multisite backup a breeze. But for others, the need to backup tens of gigabytes in an evening makes even T-1 networks inadequate for the job.

Corrigan cautions that WAN backup can lead to restoral problems. "Suppose a server goes down — you'll have people in two locations trying to figure out what is going on via telephone. And if you have a 56K [bit/sec] link and have to restore 500M bytes of data, how long is that going to take?"

Centralized management, rather than centralized backup, may be the solution in this situation.

For example, Simple Network Management Protocol or messaging systems such as Novell's Message Handling Service (MHS) that use a script file to send commands to devices could provide remote management of tape systems, allowing central control, but eliminate the need to ship hundreds of gigabytes around the WAN.

Messaging systems will also help automate user requests. "It should get to the point where it doesn't matter where the tape is located," Corrigan says. "Backup will become a network service, rather than a device you hang off a workstation or server somewhere."

For managers looking down the road, now is the time to start thinking about backup in a broader context. As the distinctions between backup, storage management, disaster planning and security continue to blur, backup as an isolated task will fade. Instead, it will become part of a complete set of network services.

Rather than worrying about tape formats, managers should be thinking about ways to ensure that information is always at users' fingertips when they need it.

Ubois is a free-lance writer based in the Washington, D.C. area.

Test draws out differences

continued from page 42

Of all the modems tested, the Motorola Codex 3261 had the most reliable synchronous connection, passing 53 of its 59 tests with no errors.

For asynchronous applications, the choice of modems is less clear cut. For users that communicate over clear lines most of the time, the Zypcom Z32t-SX modem is the best choice. The Z32t-SX retails at only $749.

But for users that tend to connect with a range of locations for asynchronous applications, the ZyXEL U-1496E Plus or AT&T Paradyne Comsphere 3810/3830 modems might be more reliable. The U-1496E Plus costs from $649 to $699, while the AT&T Paradyne Comsphere 3810 costs $1,195 and the 3830 costs $795.

Briere is president of TeleChoice, Inc., a Verona, N.J., consultancy specializing in strategic planning and analysis of intelligent networks, services and applications. He can be reached at (201) 239-0700 or MCI Mail at dbriere.

Letters

continued from page 37

page 25), I agree with T.J. Rodgers that government involvement could be harmful to competition in some respects. I, too, feel that it is essential to create a broadband information infrastructure for use by schools, hospitals and businesses, and, indeed, would be best achieved if the government did not subsidize commercial network services.

Also, regarding the "Old Networkers Home" Teletoon in the same issue, I'm 35, and that's nothing.

I started working on mainframes 17 years ago in a computer room the size of a football field and could pinpoint a failing power supply fan from 100 yards.

At 35, I hope today's young whippersnappers have some respect for those of us who feel we've just entered our prime.

Jill Houch
MIS manager
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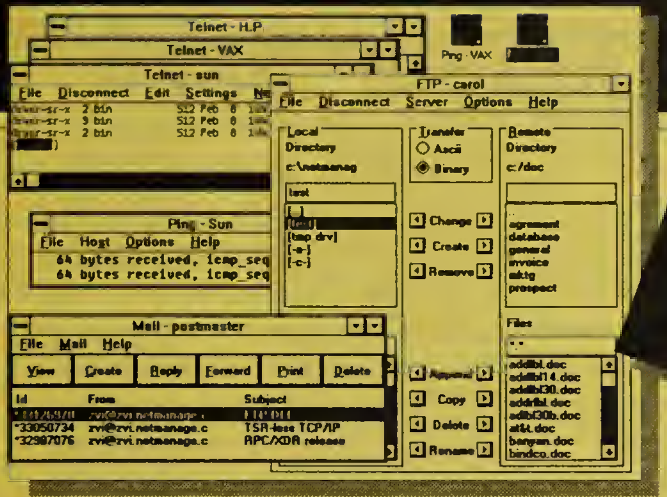

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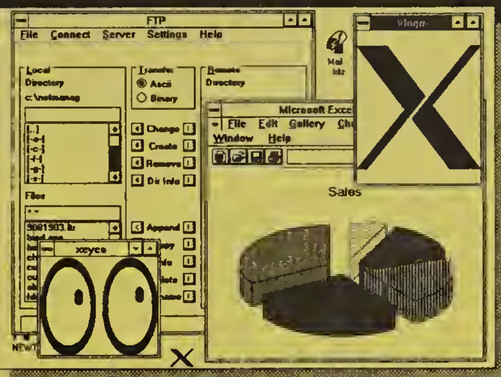

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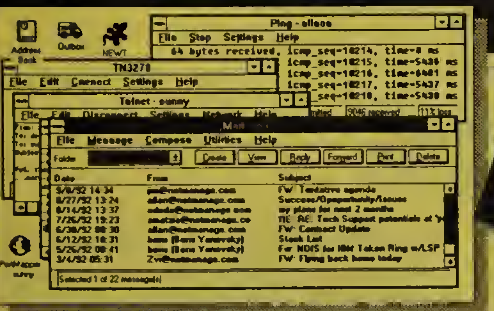

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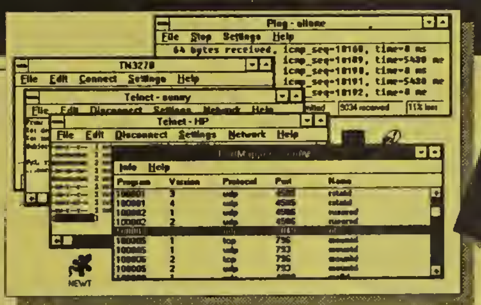

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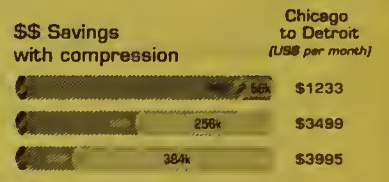

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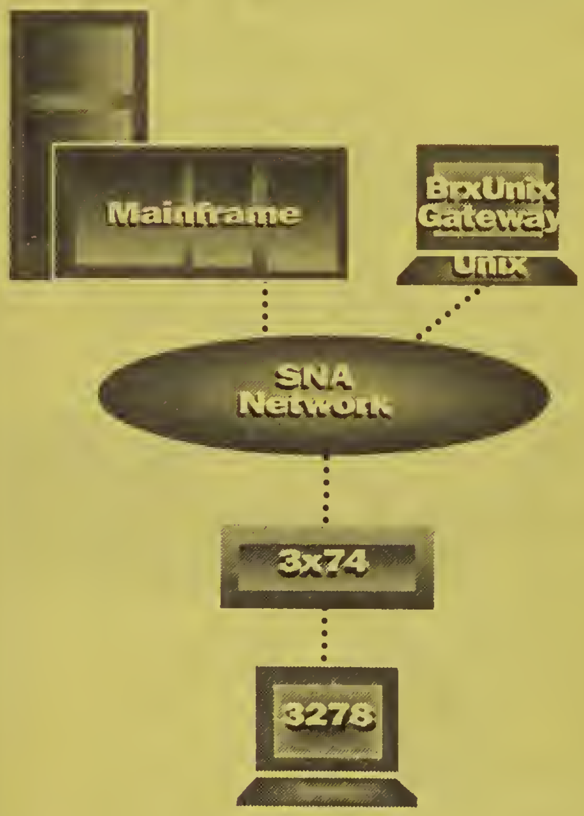

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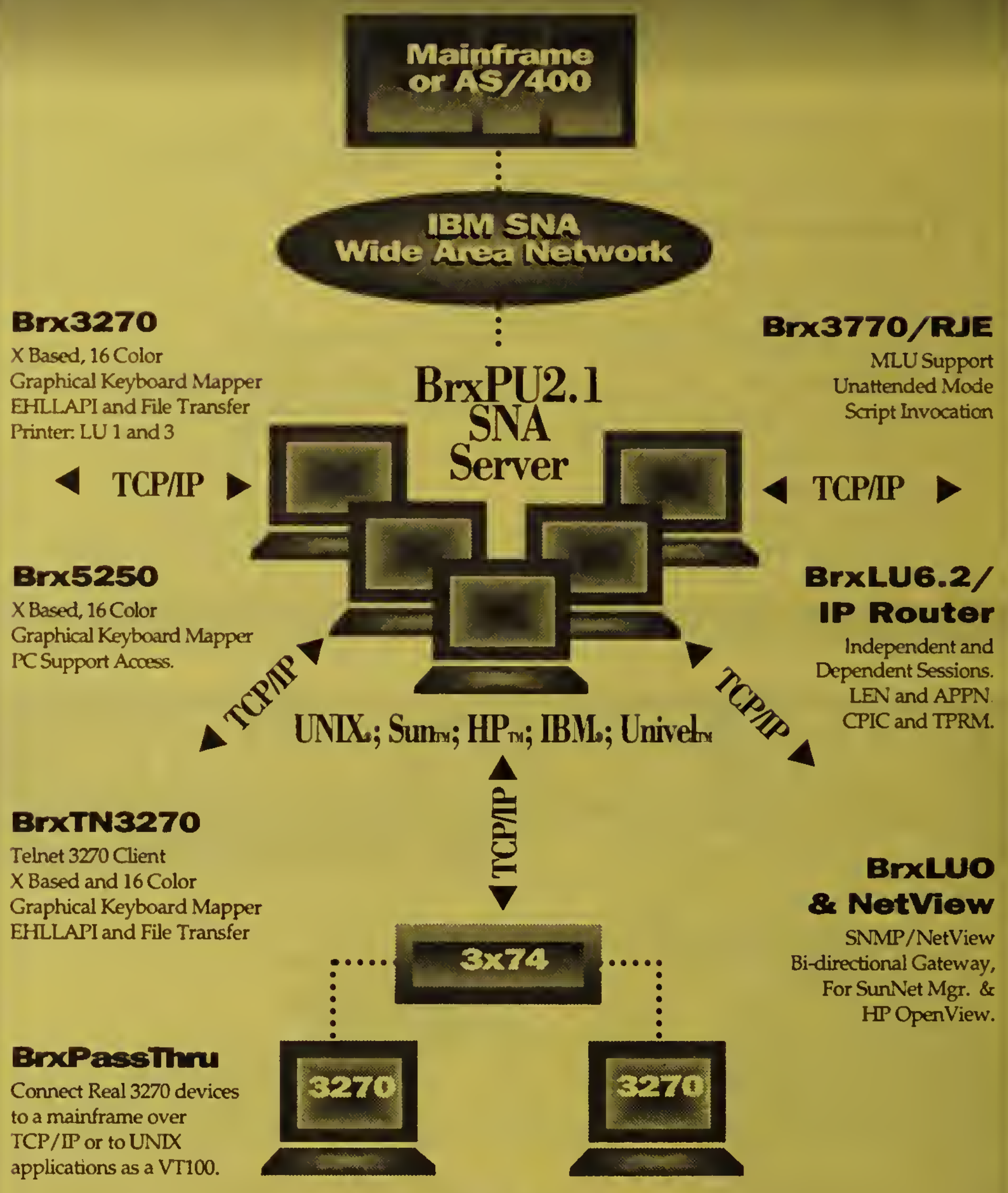

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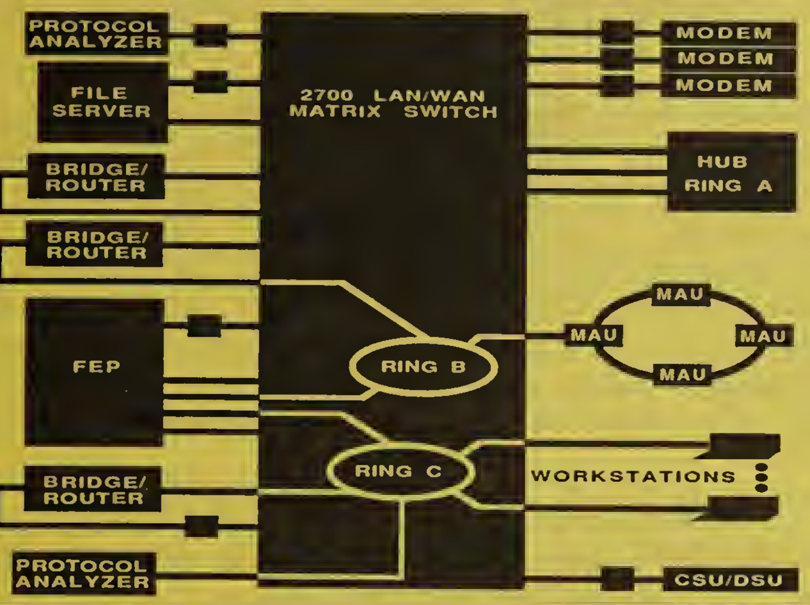

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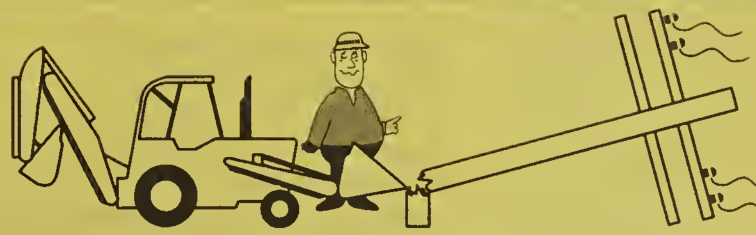

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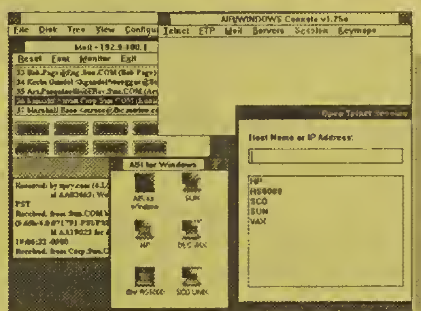

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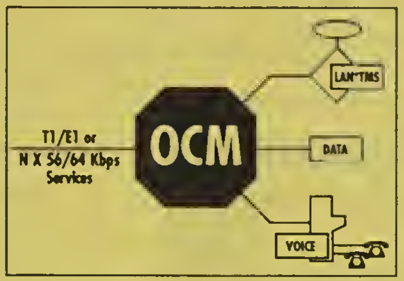

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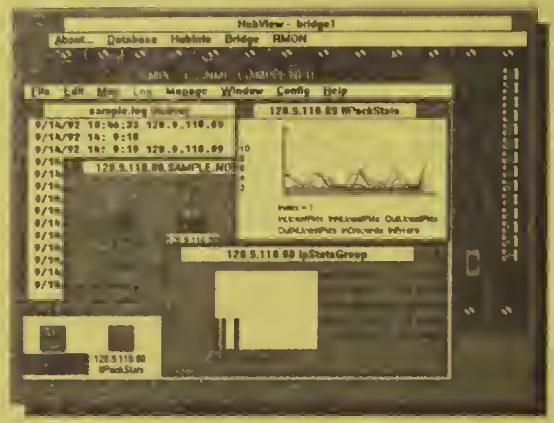
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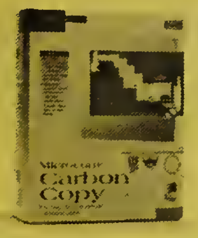

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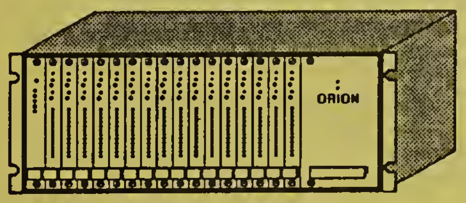

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By Paul Longoria

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DB/EXPO '93 focal point for connectivity releases

DEC, Gupta, HP, Blyth use show as launch pad.

By Bob Brown
Senior Editor

SAN FRANCISCO — Vendors of databases and related products used last week's DB/EXPO '93 trade show here as a platform from which to launch a slew of new connectivity offerings.

Digital Equipment Corp. and Gupta Corp. bolstered their data access product lines, while Hewlett-Packard Co. unveiled its data warehousing strategy and Blyth Software, Inc. introduced a new version of its client/server application development software.

DEC introduced a new version of its AccessWorks data access server, VAX-based software that provides routing and translation between multiple types of clients and databases. AccessWorks 2.0 adds write access to Oracle Corp. databases and IBM's DB2, whereas AccessWorks provided only read access before.

It also includes support for Microsoft Corp.'s Open Database Connectivity (ODBC) specification for linking Windows clients and multiple databases, said Steve Koenig, DEC's marketing manager for integrated servers.

AccessWorks 2.0 supports Information Builders, Inc.'s Enterprise Data Access (EDA)/SQL Server software, which provides connectivity to about 50 databases and features DEC's Rdb database as a data store for warehousing data on AccessWorks servers. Version 2.0 will be available in July and is priced starting at $9,016. The AccessWorks/EDA option is priced starting at $13,379.

DEC also announced new versions of its Rdb database — Versions 5.1 and 6.0 — that feature new communications functionality. With 5.1, DEC has added support for Windows applications through an adaptation to Microsoft's ODBC specification, while 6.0 includes support for stored procedures and Novell, Inc. NetWare connections to clients. Due in August, 5.1 is priced starting at $1,130, while 6.0 will ship in December with pricing starting at $1,130.

The Gupta front

Gupta announced two database access products, SQLRouter/Informix and SQLRouter/Ingres, to provide access from Windows-based applications to Informix Software, Inc. and Ingres databases, respectively. SQLRouter/Informix is now shipping, while SQLRouter/Ingres is in beta test and will ship in July. Both are priced at $250 for a single-client router and $1,595 for a router supporting an unlimited number of clients.

Gupta also said business partner Dunn Systems of Chicago has developed a NetWare services library for Gupta's SQLWindows client/server application development tool. Dunn Systems' SQLLib for NetWare offering lets developers build SQLWindows applications that have direct access to NetWare services. SQLLib for NetWare will be available by July for $595.

PHOTO © 1993 DAVID WEINTRAUB

HP opens data store

As expected, HP laid out its OpenWarehouse strategy for storing data, which will be used for end-user decision support applications (*NW,* May 3, page 4). Sridhar Ramanathan, an HP product marketing manager, said OpenWarehouse will "help end users make fast decisions by separating historical data from operational data."

Under OpenWarehouse, HP will provide consulting and systems integration services to help users tie together data warehouse systems, data access and reporting tools, data warehouse management systems and database communications offerings from a variety of sources. OpenWarehouse partners include Informix, Ingres, Oracle, Red Brick Systems, Sybase, Inc. and others.

Blyth beefs up OMNIS

Blyth rolled out OMNIS 7^2, a development tool for building client/server Windows and Macintosh applications. New features in OMNIS 7^2 include version control, which allows teams of developers to work on large or complex applications, and change management, a system for disseminating distributed application upgrades to end users across a net.

Blyth has also increased the number of databases accessible via its application tools by adding support for ODBC and Apple's Data Access Language.

OMNIS 7^2 will ship this summer and cost $3,000 during an introductory period ending in September and $3,750 thereafter. Upgrades will cost $500 during the introductory period and $2,500 afterward.

Blyth: (800) 346-6647; DEC: (800) 344-4825; Dunn Systems: (800) 486-3866; Gupta: (415) 321-9500; HP: (800) 637-7740.

HP enhances OpenView management

By Jim Duffy
Senior Editor

PALO ALTO, Calif. — Hewlett-Packard Co. this week will unveil a suite of new and repackaged systems management products intended to transform its OpenView platform into an integrated network and systems management tool.

HP will roll out products designed to monitor, measure and control critical performance parameters of HP 3000 and 9000 minicomputers and IBM RISC System/6000 and Sun Microsystems, Inc. SPARCstation workstations in a distributed network.

The products will include a centralized management application that runs on an OpenView console and applications to govern data storage, print spooling, software licensing, and network testing and troubleshooting (*NW,* May 3, page 4).

"This is the first real cohesive set of systems management tools [from HP]," said John McConnell, vice president of Infonetics Research, Inc., based in Boulder, Colo.

The key to HP's systems management offerings is OpenView OperationsCenter, an application that runs on a centralized OpenView console and receives event information from management agents and initiates remedial action.

OperationsCenter can initiate automatic reactions to conditions that are predefined by administrators or perform predefined actions at the click of a mouse. In addition, event information can be forwarded into a trouble-ticketing system for more thorough problem resolution and tracking.

The new OpenView applications that work with OperationsCenter include PerfRX, a performance analysis tool for evaluating computer performance over a period of time. PerfRX allows managers to identify the actual applications or processes that are using system resources, HP said.

Another new application is a hierarchical storage management package that automatically migrates client and server files between magnetic disks and optical disk libraries on-line. This capability is intended to free up storage capacity.

Existing applications that have been bundled into the OpenView systems management suite include OmniBack and OpenSpool for backup and print management, respectively. Users can now manage multiple backup and print domains from a central OpenView console.

Also, when OperationsCenter identifies a backup problem, it automatically brings up the OmniBack menu screen so a manager can pinpoint the fault.

Two other existing applications that are now integrated with OpenView are HP's Software Distributor, which automates the distribution and management of software in a network, and NetLS, which provides distributed licensing of software based on usage.

OperationsCenter costs $14,700 in a 12-node, 32-user configuration and will be available in August. In the same configuration, OmniBack is available now for $7,650; OpenSpool will be available in June for $4,700; and Software Distributor will be available in August for $4,400.

PerfRX costs $5,500 for a single unit and is available now. A NetLS developers' kit costs $4,808 and is also available now. The hierarchical storage management application will be available in the second half of 1993, and pricing will be announced at a later date.

HP: (800) 637-7740.

Server vendors ready releases

continued from page 6

ents, as well as DEC's own Ultrix and VMS environments. "The generic DOS client support means this can run in a NetWare environment, or where there's no network at all," Rensing said.

While DEC is scaling down, companies such as Compaq, Dell, HP, IBM, NetFRAME Systems, Inc. and others are looking to scale up by bringing out servers based on Intel's new Pentium chip. For example, HP next week is expected to announce a new line of servers dubbed NetServer, according to sources close to the company.

The NetServer will include the LE, LM and LH for low, mid-range and high-end computing. The LE and LM will be introduced next week, but the firm will only discus intentions to build the LH.

The LE series will be single-processor machines designed primarily for file services, while the high-end of the mid-range LM series will come with dual Pentium microprocessors. The LH series will be an all-multiprocessing line with as many as four Pentiums built in, sources said. It is expected to be available this fall.

Each series will run Microsoft Corp.'s forthcoming Windows NT, according to sources. "It's been up and running [with NT] for some time," said one source who requested anonymity.

In addition, the LM line will come with NetServer Assistant, a net management package that will work with the company's OpenView network management platform.

In addition to HP, Dell next week is expected to announce a new family of servers — the 4000/XE Server Series — as well as map out its Pentium strategy for the future. Compaq, too, will officially bring out a Pentium-ready version of its existing ProSignia server line.

> While DEC is scaling down, others are looking to scale up with servers based on Pentium.

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Although many of these machines have already been unofficially announced, the final word is expected to come on May 17, when Pentium comes to market.

DEC: (800) 344-4825; HP: (800) 637-7740.

CrossComm sets sites on SNA

continued from page 1

dent of technology.

The product is based on a parallel router architecture that will initially be used not for meshed networks, but to handle traditional SNA traffic, where data flows between a single host site and multiple remote locations.

It can be equipped with up to 32 Reduced Instruction Set Computing (RISC) microprocessors — providing a total of 1,000 million instructions per second — to provide the fast packet processing required for SNA traffic.

Routing modules are each equipped with four Intel Corp. i960 microprocessors — one for routing, one that acts as the router's Address Processor & Directory Engine and one on each of the two I/O modules.

These provide a packet forwarding rate of 30,000 packet/sec on each module for an aggregate throughput of 240,000 packet/sec for 64-byte packets on a fully configured XL 80 with eight routing modules.

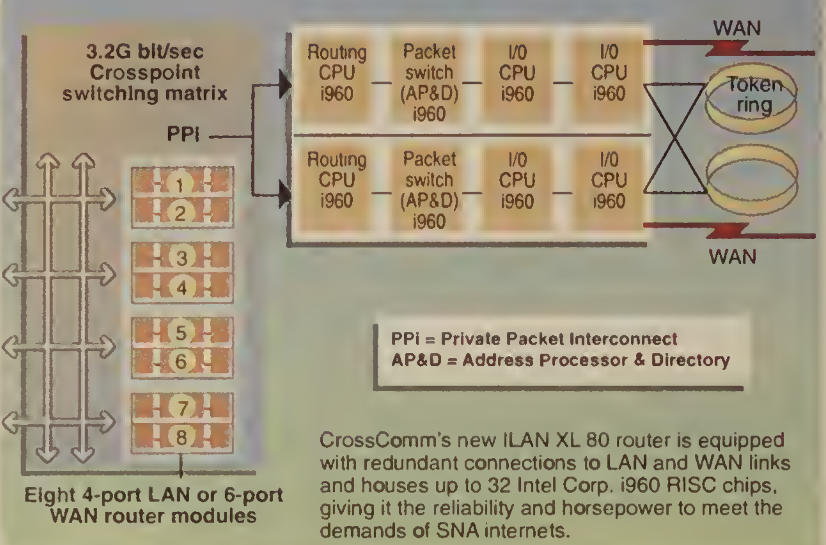
Each module is linked to a single adjacent router module via a so-called Private Packet Interconnect, enabling one module to back up another and provide redundant wide-area network or LAN links.

Except when in backup mode, all processing and routing is handled by a single router module, with no system bus to contend with. That offers packet latency of less than 70 microsec.

Each router module supports any combination of four token-ring or Ethernet interfaces or six wide-area interfaces, thereby enabling the entire router to support a total of 32 LAN or 48 WAN ports up to T-1 speeds.

In the first quarter of 1994, CrossComm will ship a $1,500 routing module upgrade that will enable the modules to take advantage of the XL 80's gigabit switching matrix. The matrix will then act as the router backplane, enabling all eight multiprotocol routers to communicate with each other, instead of only with a single adjacent router.

ILAN router aims to excel at SNA


3.2G bit/sec Crosspoint switching matrix
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Routing CPU i960
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Packet switch (AP&D) i960
I/O CPU i960
I/O CPU i960
WAN
Token ring
WAN
1
2
3
4
5
6
7
8
Eight 4-port LAN or 6-port WAN router modules
PPI = Private Packet Interconnect
AP&D = Address Processor & Directory

CrossComm's new ILAN XL 80 router is equipped with redundant connections to LAN and WAN links and houses up to 32 Intel Corp. i960 RISC chips, giving it the reliability and horsepower to meet the demands of SNA internets.

GRAPHIC BY ANNE GIANCOLA

SOURCE CROSSCOMM CORP., MARLBOROUGH, MASS.

That will better enable the router to support local LAN-to-LAN and native ATM links, such as may be required with IBM's Advanced Peer-to-Peer Networking (APPN).

The XL 80's multiple RISC chips will also be put to further use down the road, Samberg said, enabling the router to support SNA prioritization and applications such as APPN directory services.

CrossComm also plans to equip the router with four token-ring and Ethernet buses apiece as well as three WAN buses. Samberg declined to provide further details but said the capabilities will be announced and available later this year.

A maverick approach

Anura Guruge, an independent strategic consultant based in New Ipswich, N.H., said the ILAN XL 80's redundant backbone links and raw horsepower, coupled with the vendor's Protocol Independent Routing (PIR) software, will keep SNA response times down and ensure reliability. PIR uses a proprietary routing algorithm that supports SNA traffic and gives the router the ability to route around failed links in less than 10 seconds (*NW*, Nov. 11, 1991, page 1).

Paul Callahan, a senior analyst at the Cambridge, Mass.-based Forrester Research, Inc., called the XL 80 architecture notably different from high-end approaches put forth by vendors like Cisco Systems, Inc. and Wellfleet Communications, Inc.

"It's a maverick approach in that CrossComm is focusing on memory and processing power," Callahan said. "They're leapfrogging the high-speed bus issue and cutting right over to ATM."

Mike Morgan, vice president of data networking at American States Insurance Co. in Indianapolis, is currently evaluating several vendors' routers, including the ILAN XL 80. "Reliability, good performance and good price/performance are my key requirements, and, so far, the [ILAN XL 80] is looking like the winner," Morgan said.

The ILAN XL 80 will be available next month with a base unit price starting at $20,000.

CrossComm: (800) 388-1200. ◘

Legent preps new distributor

continued from page 6

mation about each networked system. A "warehouse manager" controls information flow to and from the warehouse.

For each software change, users define each machine, user or group of users to receive the software updates and when they should be delivered.

A feature, called Insure, provides error recovery, status reports and real-time notification of file-transfer problems. These reports can be seen on an optional OS/2-based network administrator's machine tied to the mainframe via a token-ring, Synchronous Data Link Control or X.25 link.

Analysts said DistribuLink will offer a strong alternative to IBM's NetView Distribution Manager (DM), which lets SNA users update only SNA device software from the mainframe, and Tangram Systems Corp.'s AM/PM.

"[DistribuLink] will be very strong competition for NetView DM and the Tangram product because of its multivendor support," said Igor Stenmark, a program director with Gartner Group, Inc., a Stamford, Conn., consultancy.

DistribuLink's only drawback is that it is mainframe-based and will appeal primarily to SNA users, analysts said.

"Legent will have to quickly move away from being SNA-only and let users perform some of these electronic software distribution functions from local-area network servers," Stenmark said.

Legent promised to support the Transmission Control Protocol/Internet Protocol soon and to let DistribuLink work with LAN servers in a tiered fashion, whereby DistribuLink, located on the mainframe, downloads software to a server, and the server distributes it on a LAN, Legent's Cary said.

DistribuLink will ship in June. Pricing is based on the size of the MVS platform and the number of users.

Legent: (800) 676-5468. ◘

Standards plan raises hackles

continued from page 1

for Europe.

Non-ETSI members stand little chance of seeing their technology implemented as ETSI standards — which run the gamut from those addressing facsimile to videoconferencing — possibly impacting a company's chances of success in Europe.

IBM, for one, has refused to sign the ETSI policy document, calling it compulsory licensing. "It goes beyond what is appropriate for a standards body relative to an IPR policy," said Richard Holleman, director of IBM's telecommunications and standards practice.

IBM, like other companies whose technology has found its way into standards, follows the principles set by the International Standards Organization, the Consultative Committee on International Telephony and Telegraphy and ANSI: Holders of patents must license their technology on nondiscriminatory and reasonable terms if it is accepted as a standard.

Under the ETSI policy, companies would have to sort through their patent applications every time ETSI issued a work statement for a new standard and let the organization know in 180 days if their technology should not be considered as a standard. ETSI could claim rights to technologies of companies that fail to notify the organization.

"The work statements are written in very general terms, and it's difficult to predict how a standard will evolve in its final form, perhaps two years later," said Bill Ellis, IBM counsel, pointing out the difficulty of attempting to adhere to the policy. He noted that 1,200 draft ETSI standards are currently in the works.

However, it is not clear why any deadline should be required since companies have traditionally taken a proactive stance in the standards arena, spending considerable time, money and people power to aggressively

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Groups draw cheers and jeers

continued from page 1

door wide open for vendors to come in and implement only part of the spec, which undermines the ultimate goal of achieving application portability across databases."

IDAPI representatives responded to the critics' charges and pointed to the growing number of companies backing the specification as testament to its value. The IDAPI initiative, which is led by Borland International, Inc., IBM, Novell, Inc. and WordPerfect Corp., announced 18 new partners last week, bringing total membership to 51.

"We did not create IDAPI for political reasons," said Betsy Burton, senior product manager for IDAPI at Borland. "Companies are backing IDAPI because it is a multiplatform API that enables applications to access both SQL and other types of databases."

Others skeptical

But critics charge that after reviewing the draft specification, which was released in February, they do not see how IDAPI can live up to its advanced billing.

According to Kyle Geiger, Open Database Connectivity (ODBC) general manager at Microsoft, the IDAPI specification does not provide the arguments for many functions and show how the functions are interrelated. It also is missing many key functions for such things as asynchronous processing, catalog access and stored precedures. He said many of the functions are specific to Borland databases and there is not a clear indication how IDAPI will communicate with ODBC.

"The IDAPI spec is very incomplete, and it is missing major areas of functionality. It's at the same state ODBC was 18 to 24 months ago," Geiger said.

Burton said the IDAPI specification is a working draft that is being refined by a task force receiving input from IDAPI partners. She said the group is on schedule for issuing a preliminary software developers' kit this summer that will run on OS/2, NetWare and Windows.

Several people questioned whether IDAPI could support adequate levels of performance.

David McGoveran, president of Alternative Technologies, Inc., a research and consulting firm in Boulder Creek, Calif., said IDAPI imposes a lot of overhead by translating requests back and forth between relational and nonrelational interfaces.

"IDAPI may be good for accessing desktop databases, but not relational databases," McGoveran said.

However, Microsoft's Geiger said even using a navigational API to access a host ISAM database requires remote procedure calls and additional code on the host system.

"When you think through the performance issues, you wind up with a client/server solution," he said.

The IDAPI specification also does not clearly define how to link information between database tables. The way tables are push the technology they want to see become a standard.

Frede Ask, deputy director of ETSI, said the reason for the deadline is to keep ETSI technical personnel from considering technologies that are not eligible to become standards.

The ETSI policy also sets up the group as the final arbitrator in any licensing disputes, effectively eliminating the role of the court in settling licensing disagreements.

The ETSI policy is retroactive, affecting the 250 or so standards already approved by the organization, such as Global System Mobile (GSM), the European cellular standard based on Motorola technology. And the policy states that its terms not only apply in Europe, but also anywhere its standards are implemented in equipment.

Ask said the new arrangement would be an "inconvenience" to companies but refuted the assertion that the policy differs dramatically from the ISO's. "It's just organized in more detail than ISO," Ask said. He acknowledged that signing the IPR policy would require a complete overhaul of the legal framework in effect at most companies.

ETSI will have a meeting on July 12 to change its own rules and procedures so a legal framework exists within the organization to administer the new policy, Ask said.

The ETSI policy states that technology selected for an ETSI standard must be licensed on a nondiscriminatory basis to other ETSI members. But nonmembers may find it more difficult or more expensive to license ETSI technology.

Ask acknowledged that U.S.-based companies have been big contributors to European standards, noting that Motorola's cellular technology became the GSM standard. To date, Motorola has been "very fair and correct" in its licensing requirements with ETSI, Ask said.

Motorola has not yet decided whether it will sign the ETSI IPR Policy.

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linked determines how users navigate through the ISAM database to find the information they want.

Burton said IDAPI contains commands for specific navigational databases, such as Borland's Paradox and dBase as well as Novell's Btrieve, since each database has unique ways of navigating through tables. In fact, Borland has implemented IDAPI within Paradox for Windows and Quattro Pro for Windows, both of which exhibit strong performance when accessing external data sources, she said.

"The only difference between IDAPI and ODBC is that Borland is using IDAPI in its products. We are proving our performance claims," she said.

Microsoft declines IDAPI

SAN FRANCISCO — Microsoft Corp. last week slammed the door shut on the question of whether it would support a database API developed by rival Borland International, Inc. but raised the possibility that it would incorporate key features of the API in its Open Database Connectivity (ODBC) specification.

To no one's suprise, Microsoft officials said that after closely reviewing the Integrated Database Application Program Interface (IDAPI) standard, they see no reason to support it, claiming that Microsoft's ODBC standard provides more robust functionality.

They added, however, that Microsoft is exploring adding extensions to ODBC that would let users access ISAM databases, which is what IDAPI's Navigational/Call Level Interface purports to do.

"We haven't been sitting on our hands [in regard to ISAM databases]," said Lowell Tuttman, senior product manager for API marketing at Microsoft. "We think making extensions to ODBC to exploit the ISAM model makes more sense than taking the radical approach adopted by the IDAPI group."

The IDAPI group is developing a multiplatform API that will provide access to SQL and navigational databases.

Tuttman refused to provide more details about Microsoft's efforts to support navigational databases within ODBC except to say that it is not a trivial undertaking and the firm is trying to figure out the best way to approach the problem.

"With desktop or ISAM databases, the API, user interface and database engine are all tied together, which is what makes these databases attractive," said Kyle Geiger, ODBC general manager at Microsoft.

"It's not at all clear what the best way is to separate these elements and still preserve what people like about the databases," he added.

— *Wayne Eckerson*

Sun preps VINES, server offerings

continued from page 6

formance."

The deal to bring VINES to the scalable processor architecture platform had been expected (*NW*, May 3, page 2) and follows a similar arrangement between Banyan and Hewlett-Packard Co. that will bring VINES to HP Unix machines.

Both products are expected to be available by the end of the year, and a similar agreement is expected soon between Banyan and IBM.

SunSoft, Inc.'s Interactive Unix System 4.0 is based on Unix System V/386 Release 3.2 and runs on Intel Corp.-based computers. It is mainly used in multiuser process control, factory automation and point-of-sale applications in small to midsize companies. Users range from the Philadelphia Phillies baseball team to the U.S. courts to BMW AG, Inc. and The B.F. Goodrich Co.

> "We feel confident that over 90% of SCO applications will run," said Anderson.
>
> ▲▲▲

The new version includes significant interoperability improvements, such as extended binary compatibility to run many applications, such as The Santa Cruz Operation, Inc.'s (SCO) SCO Unix and SCO Open Desktop.

"We feel very confident that over 90% of SCO applications will run," said May Anderson, SunSoft director of marketing. Interactive Unix already ran character-based Xenix applications.

An enhanced version of the optional Interactive VP/ix extension that runs DOS and Windows applications will be supported later this year using Windows Application Binary Interface technology, Anderson said. Approximately 5,000 applications are now supported, she added.

SunSoft also announced enhanced versions of extensions such as Interactive Transmission Control Protocol/Internet Protocol, designed for faster performance and better compatibility with other TCP/IP networks.

"We removed the incompatibilities between SCO's TCP/IP and ours," said George Meyer, SunSoft's product marketing manager for Interactive Unix. "We implemented some of SCO's function calls."

Enhancements to the Interactive Network File System extension improved reliability, according to the company.

The new release of Interactive Unix also supports long file names to make it easier to work with other operating environments, including Solaris. Symbolic links let users work with files in any work group on the network, eliminating the need to save the same file in multiple locations. Selectable console support lets systems administrators work from any terminal on the network.

> Enhancements to the Interactive Network File System extension improved reliability.
>
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Interactive Unix System 4.0 is available now and costs $495 for the single-user version. The Base Solution, a multiuser version, costs $895 and includes a FastBack Plus backup utility.

Users of Interactive Unix System 3.0 can upgrade for $195, or, for $295, they can get the multiuser version.

A new release of Interactive Unix is scheduled for the second quarter of 1994.

Sun: (415) 960-1300.

DEC to forge All-In-1 ties

continued from page 1

browsing.

Currently, All-In-1 is a terminal-to-host office system that requires personal computers to emulate DEC VT terminals. During the next 18 months, through a series of software releases, DEC plans to transform All-In-1 into a client/server-based office package that will take advantage of desktop PC power, said Steve Martin, DEC's All-In-1 marketing manager.

"The first release of TeamLinks was not targeted at the All-In-1 installed base," Martin said. "It actually required customers to put in the DEC Mailworks server." Mailworks is a separate DEC E-mail offering from All-In-1.

This fall, DEC will release TeamLinks client software that will be able to use the All-In-1 Integrated Office System (IOS) as its mail server. This will tie TeamLinks to the installed base of 5 million All-In-1 users and, DEC hopes, make TeamLinks more appealing to those users.

"The number of All-In-1 customers who, to date, are starting to move to TeamLinks is minimal," Martin explained. "There are a number who are piloting TeamLinks with a DEC Mailworks server. But no one's planning rollout until there's a version of TeamLinks available that lets them add TeamLinks to their PCs and have All-In-1 stay the same behind it."

DEC started building tighter TeamLinks/All-In-1 hooks last week by unwrapping TeamRoute Version 1.1 for All-In-1.

TeamRoute is software that automatically directs any document stored in a file cabinet to any user on the network. TeamRoute Version 1.1 for All-In-1, which costs $364 per client, now supports All-In-1 IOS file cabinets.

Linking TeamLinks with All-In-1 is vital if DEC wants to play in the work group arena with the likes of Lotus Development Corp. and its wildly successful Notes product, analysts said.

"In order to be viable, there has to be a migration path between All-In-1 and TeamLinks for those organizations that want to move from the host/terminal [paradigm] to client/server," said Kristina Filistowicz of Dataquest Corp. in San Jose, Calif. "[Desktops and LANs are] really where the largest potential for TeamLinks is, and that's a potential that Digital hasn't yet learned to tap because they don't have the mindshare at the desktop that companies like Lotus do."

Also announced last week was All-In-1 Starter Version 3.0, a subset of the All-In-1 IOS that provides users with access to E-mail, word processing and the All-In-1 file cabinet. At $266 per client, All-In-1 Starter is priced at half the cost of a full All-In-1 IOS server.

DEC also rolled out All-In-1 Personal Assistant Version 1.1. Personal Assistant helps All-In-1 users manage a large number of documents by allowing them to search through mail documents and file folders and extract only the information they need.

Lastly, DEC brought out All-In-1 DESKtop Server Version 1.2 for MS-DOS and Apple Computer, Inc. Macintosh clients.

This product, which costs $210 per client, integrates MS-DOS and Macintosh PCs with All-In-1 IOS and All-In-1 Starter systems, allowing users to access All-In-1 mail and applications services from their desktop applications.

All products run on DEC VAX/VMS servers and are available now.

DEC: (800) 344-4825.

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Apple fleshes out Mac's role

continued from page 5

Delivering on agreements between Apple and Microsoft set in July 1992, last week's announcements included an ODBC software developers' kit (SDK) to let Macintosh developers build client applications and drivers using ODBC.

Apple also announced that it has expanded its Data Access Manager facility to support ODBC. Eventually, the company plans to give its Macintosh DAL client an ODBC driver designed to let the ODBC applications work with DAL platforms and databases. Also, Apple is working with Microsoft to develop a new DAL client for Windows that would give ODBC Windows applications access to DAL servers.

These developments will lead to one software solution that gives both Macintosh and Windows ODBC client applications access to the 17 database management programs on the 15 host server platforms that currently support DAL, Nauman said.

Initial shipments of the ODBC SDK are scheduled to begin this month, while the client portions will be announced later this year. The company is also assessing the need for DAL client connections to ODBC databases, he said.

In addition, Apple announced full DAL support for TCP/IP, including a new DAL server for IBM MVS host systems using TCP/IP connections. Running on the MVS host server, this provides the only true TCP/IP connection to IBM DB2 databases from either Macintosh or Windows clients, Nauman said.

The company also extended TCP/IP support to existing DAL servers for IBM Application System/400 and VAX/VMS. DAL's TCP/IP support had been limited to VM/CMS servers and its own A/UX and Workgroup Server 95s.

"Some of our clients have had significant problems with interoperability on the network," said Charles Lukaszewski, chairman of Network Strategies Group, a systems integrator in St. Paul, Minn. These enhancements should correct that, he said.

Available in June, the new server software will be priced from $35,000 to $50,000 for the DAL Server for MVS TCP/IP, $6,000 to $12,000 for the DAL Server for VAX/VMS and $4,250 to $20,000 for the DAL Server for AS/400, depending on the number of users.

If DAL is designed to address particular issues concerning enterprise connectivity, Apple's VITAL framework is intended to fit the various parts of an IS into a coherent whole.

VITAL divides enterprise systems into four related components: desktop integration, data capture, data access and repository, all tied together by a systems infrastructure.

PHOTO ©1993 DAVID WEINTRAUB

Steve Weyl, Lowell Tutman, Phil Edholm, John Fulton, John Nauman.

The publication of the VITAL guides at the MAC-IS user group conference in San Antonio, Texas, is designed to give companies details of Apple's logical road map and a reference guide on how to plan, design and develop a complete client/server-based IS. Originally conceived for Apple's own internal IS usage, VITAL has long been touted as Apple's blueprint for enterprise systems design, but the company is only now delivering the lowdown on how to make it work.

The more than 1,000 pages of systems design guidelines detail an infrastructure for companies trying to implement client/server solutions without throwing away investments in existing technology. It lays out "where you want to put what kinds of data, depending on what you want to do with it," said Jeri Crittenden, director of strategy and operations for ESD.

VITAL is platform- and vendor-independent and will be used by Apple and third parties to map product offerings into the various product categories.

In other news, at its Worldwide Developers Conference this week, Apple is expected to give third-party developers an advance look at its work with Novell, Inc. to port parts of the Macintosh operating system to the Intel Corp. personal computer and other platforms.

According to sources briefed by Apple, the company's apparent goal is to have the Macintosh interface also run on all major Unix workstation platforms, either in full screen or a window.

Apple also plans to use the conference to tell developers that another porting effort, the PowerPC project to create a new Reduced Instruction Set Computing architecture capable of running Macintosh and other operating systems, is ahead of schedule. The first results could hit the market late this year, observers said.

Apple: (408) 996-1010.

AT&T widens service reach

continued from page 1

width-greedy applications, firms use SDDN primarily for videoconferencing, disaster recovery for dedicated data links and to connect far-flung local-area networks.

The plan to enhance SDDN to enable customers to reach off-network sites that use any of AT&T's switched digital data services is expected to broaden use of the service.

This will give users more flexibility by enabling them to extend SDDN to any location in the country that has a digital pipe into the AT&T network. Previously, before only sites that were programmed in as SDDN sites could be accessed.

It will also enable users to extend common SDN features, such as call screening, to SDDN sites. With call screening, net managers can designate which sites its employees can send and receive data from, based on parameters such as time of day.

Further, off-net SDDN calls will be included in SDDN bills and count toward volume discounts.

"This is a feature that members of AT&T's SDN users group had assigned a high priority," said Daniel Briere, president of TeleChoice, Inc. a Verona, N.J., consultancy. "AT&T is addressing the needs of SDN users by [enhancing] its network to deliver [off-net support]."

Starr said support for off-network sites has been part of SDN for years and has been widely used. "Customers and consultants asked us when we were going to bring this capability to SDDN."

Off-net SDDN calls will be included in SDDN bills and count toward volume discounts.

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AT&T will also be able to offer in July end-to-end 64K bit/sec clear channel transmission to SDDN users.

Mike MacKenzie, product manager for SDDN, said the local exchange carriers today throttle down 64K bit/sec links on an ISDN Basic Rate Interface to 56K bit/sec before handing them off to AT&T.

"The only way to get 64K bit trunking from end to end was to use PRI access at each site," MacKenzie said.

With Signaling System 7 links between AT&T's network and the local telephone companies' networks, AT&T will be able to offer SDDN clear channel 64 end to end, he said.

AT&T said its recently announced Network Administration System, which enables users to order routing changes and test net designs, can perform the same functions for SDDN (*NW*, April 12, page 8).

AT&T is also working on offering SDN and SDDN call detail data on a CDROM, a move which would enable users with a CDROM drive and an Intel Corp. 80386-based personal computer to support billback applications.

Starr said the CDROM is currently being beta-tested by SDN and SDDN customers. "It's much more flexible than mag tapes."

AT&T: (800) 443-4736, Ext. 736.

NETWORK WORLD

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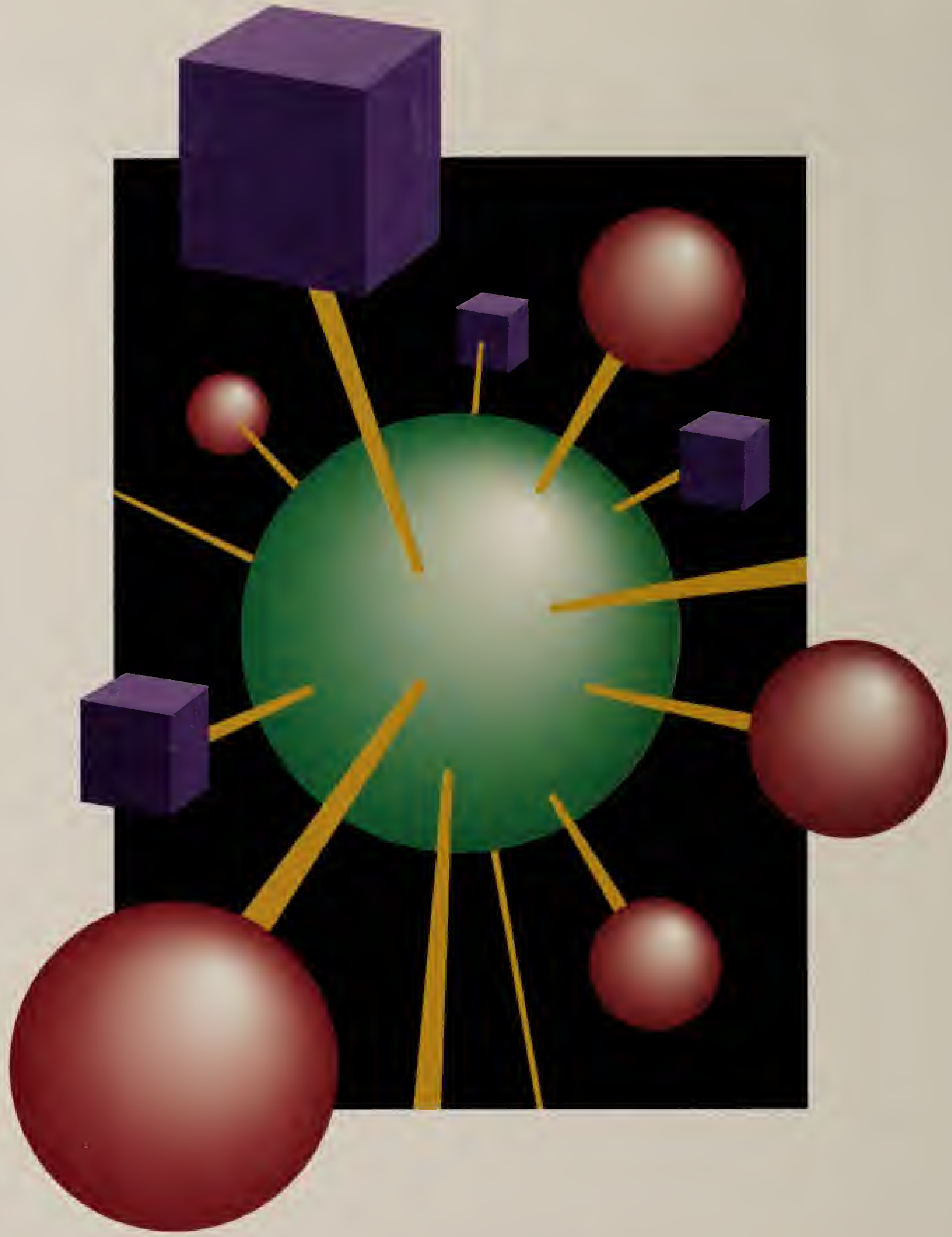

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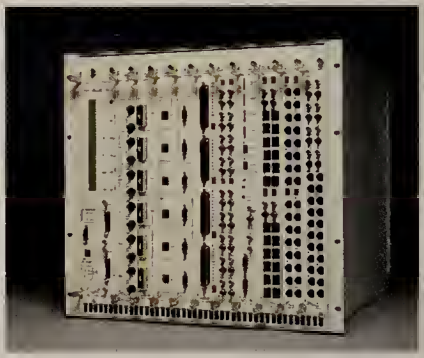

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